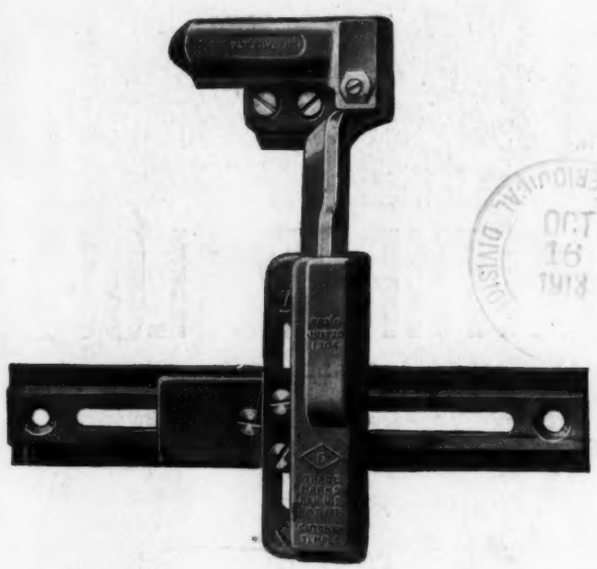
COTTON

OCTOBER, 1913

DUTCHER TEMPLES

Trade Mark Reg. U. S. Pat. Off.



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DRAPER COMPANY

SOLE MANUFACTURERS

HOPEDALE MASS.

Alphabetical and Classified Index to Advertisements Following Reading Pages

DRAPER COMPANY

NORTHROP LOOM REPAIRS

FIT

NORTHROP LOOMS

TRADE MARK

MADE BY

DRAPER COMPANY

HOPEDALE MASS.

RATINE FABRICS

CALL FOR NOVELTY YARNS SUCH AS MADE ON OUR TWISTERS

SEND FOR COPYRIGHTED
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ON NOVELTY YARNS

DRAPER CO. HOPEDALE MASS.

J. D. CLOUDMAN *Southern Agent*

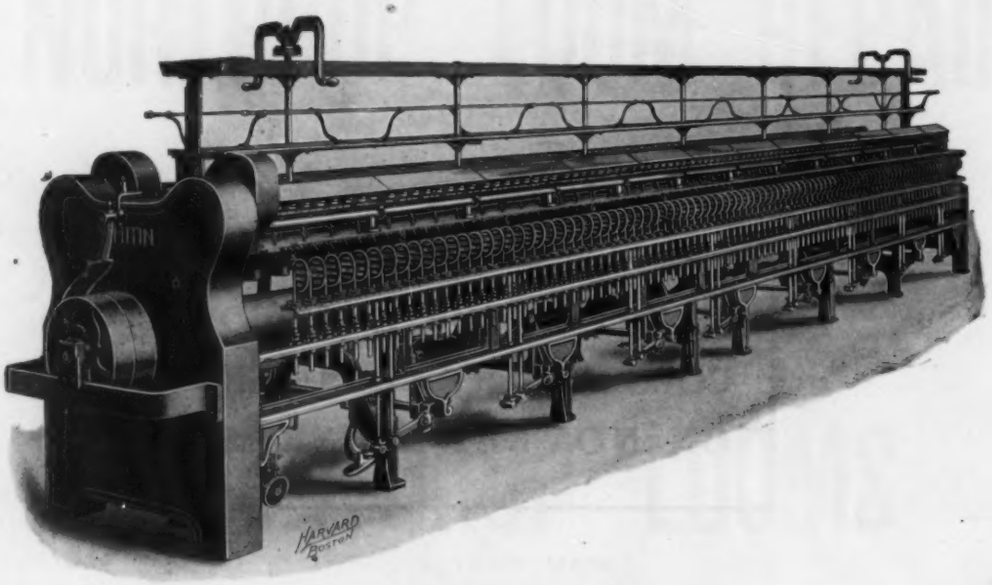
40 SOUTH FORSYTH STREET ATLANTA GEORGIA

The Whitin Machine Works

Whitinsville, Mass.

BUILDERS OF

COTTON MILL MACHINERY



Ring Spinning Frame

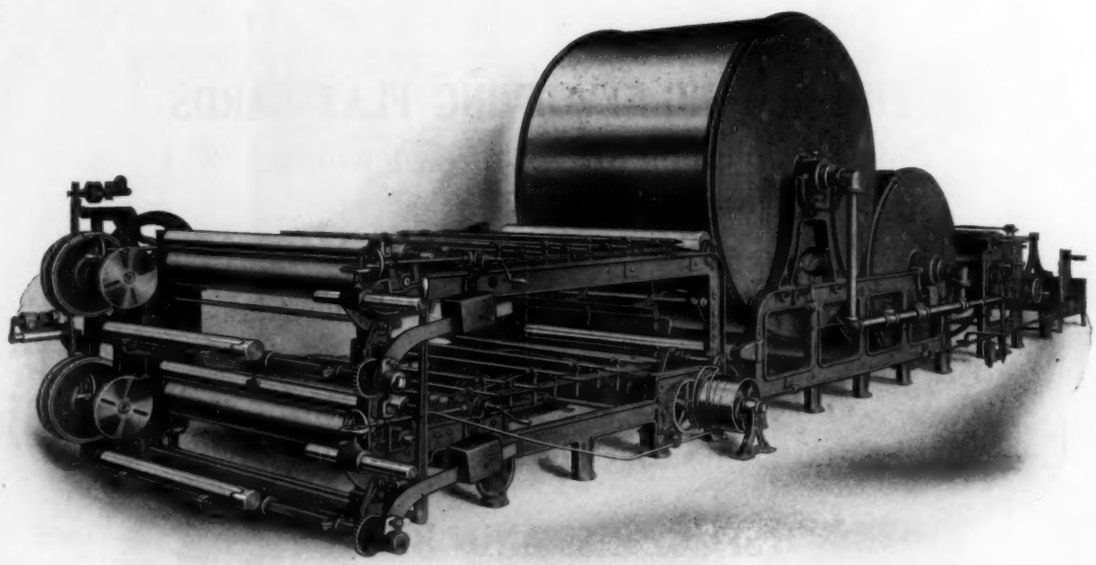
Manufacturers of Carding, Spinning and Weaving Machinery for Cotton Mills.

Southern Agent—STUART W. CRAMER,

Charlotte, N. C.

SACO-LOWELL SHOPS

Complete Textile Equipments



CYLINDER SLASHER WITH DOUBLE HEAD FOR TWO LOOM BEAMS.

Complete Slasher Room Equipments

SLASHERS FOR ALL VARIETIES OF SLASHING

Two Cylinder Slashers
Three Cylinder Slashers
Single Cylinder Slashers

Hot Air Slashers
Tape Slashers with
Brushing Attachment

Size Kettles
Pumps and Circulating
Size Systems.

Send for Special Catalog Descriptive and Illustrative of all the above.

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Shops at Newton Upper Falls, Mass., Lowell, Mass., Biddeford, Me.

ROGERS W. DAVIS, Southern Agent

Realty Building **Charlotte, N. C.**

In A Union of Specialists There Is Strength

PICKERS AND REVOLVING FLAT CARDS

Potter & Johnston Machine Co., Pawtucket, R. I.

DRAWING AND ROVING FRAMES

Woonsocket Machine & Press Co., Woonsocket, R. I.

SPINNING AND TWISTING FRAMES

Fales & Jenks Machine Co., Pawtucket, R. I.

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Easton & Burnham Machine Co., Pawtucket, R. I.

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John Hetherington & Sons, Manchester, England

J. H. MAYES, Southern Representative

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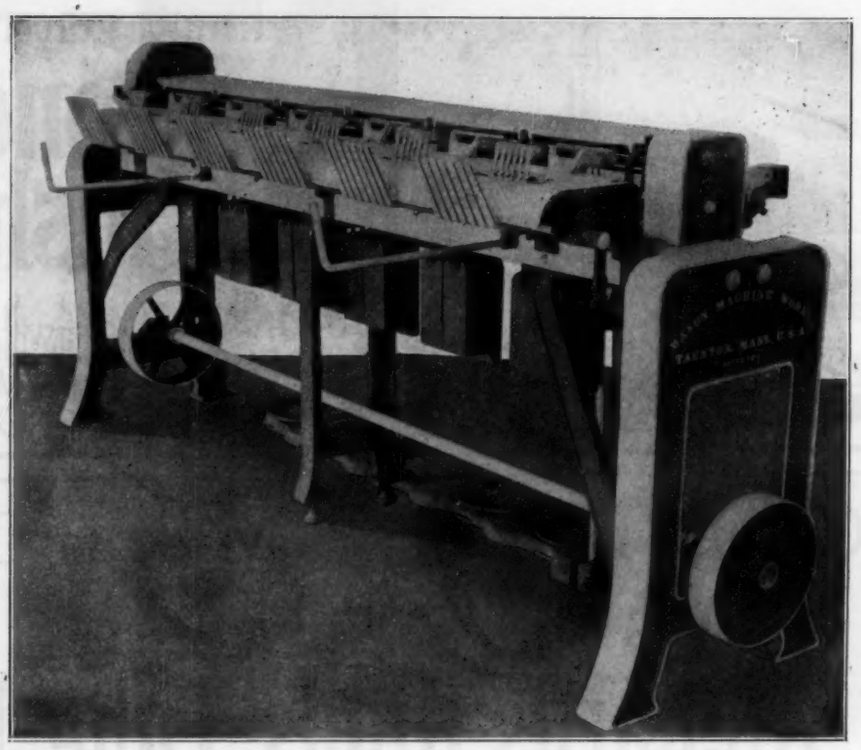
Wm. V. THRELFALL, Northern Representative

Marshall Building, Boston, Massachusetts

MASON MACHINE WORKS

MODEL B DRAWING FRAME



COTTON MILL MACHINERY

Works and Main Office, Taunton, Mass.

Southern Office, Greenville, S. C. - - Edwin Howard, Agent

We supply **SUPERIOR LOOM CRANKS** to many mills for repairs of looms not built by us.

WHITIN RINGS.

LIGHTEST RUNNING
MOST DURABLE, and
MOST ECONOMICAL.

Have you seen our
1910 Diamond Finish

WHITINSVILLE SPINNING RING CO. Whitinsville Mass. U.S.A.

The Greatest Improvement Made in Cotton Spinning in Twenty-Five Years

The Richards-Hinds Tube Roll

GUARANTEED CLAIMS

Cockley Yarn Preventor
Extra Strength of Yarn
Less Waste
Greater Production With Improved Product.
Less Change of Settings
Reduced Cost of Spinning
One-Third Saved on Leather Covered Rolls
Better Spinning

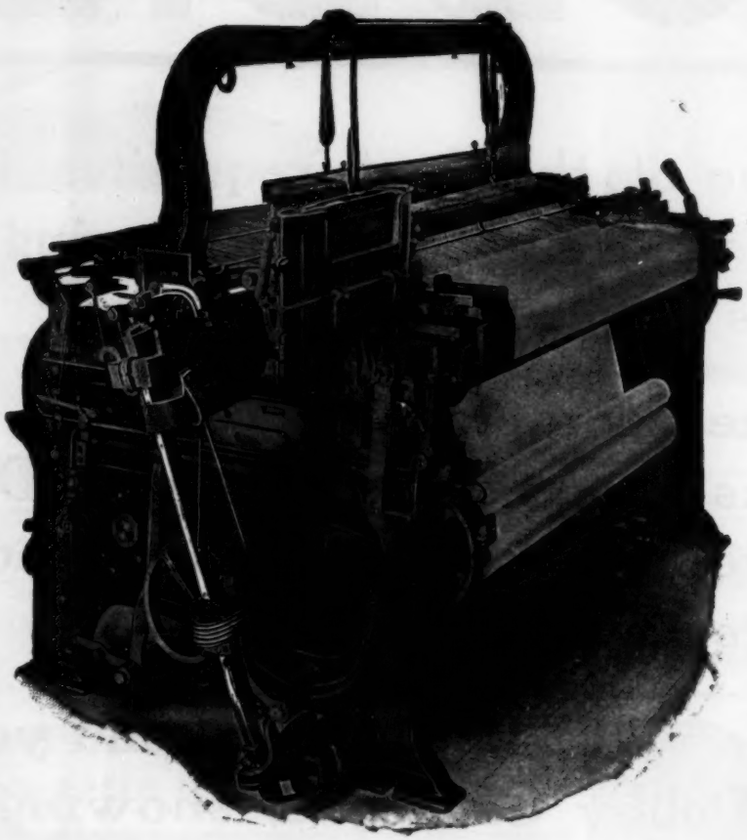
ON THE MARKET LESS THAN ONE YEAR, AND HAVE APPLIED SAME TO OVER 50,000 SPINDLES

For Information and Prices Write To

The Metallic Drawing Roll Company

INDIAN ORCHARD, MASS.

"IDEAL" AUTOMATIC LOOM



No other loom can equal it in production, quality of cloth, freedom from breakages and repairs and ability to us cope or bobbin filling.

THE STAFFORD COMPANY

READVILLE, MASS.

FRED H. WHITE, Southern Agent, CHARLOTTE, N. C.

DOBBIES

One of the first requisites in the make up of a good loom weaving fancy fabrics is a good Dobby.

The Crompton & Knowles Loom Works build a complete line of Dobbies accepted everywhere as the standard of excellence.

We will be pleased to send you our new Dobby Catalogue, showing some of the types we make.

Looms for Every Known Fabric

Crompton & Knowles Loom Works

WORCESTER, MASS.

PROVIDENCE, R. I. PHILADELPHIA, PA.

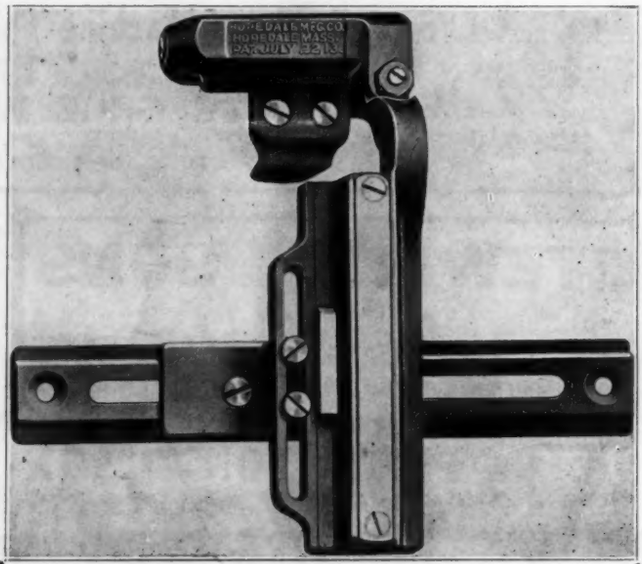
SHAMBOW SHUTTLES

Made *Are* *Wear*
STRONGEST WELL MADE *LONGEST*

SHUTTLES FITTED WITH A DEPENDABLE HAND THREADER

Spindles of extra durability, carefully fitted to your bobbins and so assembled as to save wear on your bobbins. Shambow Marble spindle stays level longest and is a bobbin saver.

SHAMBOW SHUTTLE COMPANY
WOONSOCKET, R. I.
PATENT HAND THREADING SHUTTLES



The only temple giving absolute rigidity of cloth holding pod. Adjustment provided for, insuring this important feature in long, continued service.

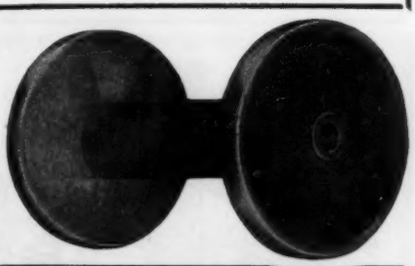
TEMPLE ROLLS made from seasoned dogwood, durable and tenacious, holding the specially pointed pins securely. Pins hardened and tempered uniformly, and have a shape and fineness of point that gives the best results with the cloth.

Also Complete Warp Stop Motions and Drop Wires.

Write us for details

Hopedale Manufacturing Co.
HOPEDALE, MASS.

You say your loss from broken spools is but a mere trifle



Did you ever attempt to prove that statement? Do it, for your own satisfaction. The magnitude of this waste is not readily apparent in the stress of other matters, but if you will apply yourself to the matter you'll see it is a big item on the wrong side of your ledger. Our METAL PROTECTED SPOOLS will save practically all this loss for you. They rarely ever break or separate. When you consider that it's the full spool which breaks, you'll see why our METAL PROTECTED Spools save you big money. The metal does not rust or stain the yarn. It protects both the outside and inside of spool. We are making a special trial offer to mills who have never used our spool. Write for this offer and sample spools at once. ADDRESS ☞

LESTERSHIRE SPOOL AND MANUFACTURING CO.
LESTERSHIRE, NEW YORK

Reels for Cotton

WOOLENS AND WORSTED

Patented Hosiery Winders, Cop Winders and Spoolers

Lindsay, Hyde & Co.,
2124 to 2130 E. York Street
Phifadelphia, Pennsylvania

MARCUS A. DARY, Agent and Treasurer.
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Dary Ring Traveler Co.

MANUFACTURERS OF
HIGH GRADE
Spinning and Twisting Travelers

Taunton, Massachusetts

A Lace and Edging Machine That Runs Quietly at High Speed

Also adapted to manufacture of fancy knit goods, coats, sweaters, shawls, nubias, golf vests and their trimmings.

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MANUFACTURER OF TEXTILE AND SPECIAL MACHINERY

STEWART & SONS

MANUFACTURERS

LOOM REEDS

Jasper and Orleans Sts. PHILADELPHIA, PA

KILBURN, LINCOLN & CO.

Makers of Looms for

Plain and Fancy Weaving

Fall River, Massachusetts

Southern Agent, O. A. Robbins, - - Charlotte, N. C.

A. G. THURSTON & SON

R. W. THURSTON, Proprietor

----- MANUFACTURERS OF -----

Fluted Rolls, Pressers for Flyers and General Machinery

Specialties made of Reseoking, Refluting, Filing and Honing of all kinds of Rolls

Speeder Flyers repaired and fitted with any style presser.

Spindles Straightened, Restopped and Retopped.

Cor. Mulberry and Division Sts., Fall River, Mass.

B C

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BARBER-COLMAN COMPANY

MAIN OFFICE AND FACTORY

ROCKFORD ILL

BOSTON, MASS. GREENVILLE, S.C.

WARP TYING MACHINES

HAND KNOTTERS FOR SPOOLING AND WINDING

Leigh & Butler

232 Summer Street, Boston, Mass.

Sole Agents in the United States and Canada for Platto Bros. & Co. Cotton Machinery.

COMPLETE MILL EQUIPMENT

Patent Barchaul Machinery for Making Yarn from Cotton Waste, Etc.

This

Knuckle Joint

Baling

Press

IN SIZES

50 to

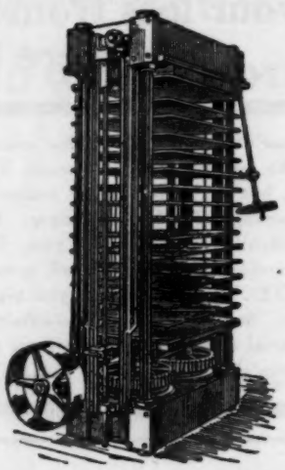
500 TONS

Send for Catalog

BOOMER & BOSCHERT PRESS CO.

455 W. Water St., Syracuse, N. Y.

A. H. WASHBURN, Charlotte, N. C., Southern Agent



RELIANCE

Hot Plate Screw Press

FOR

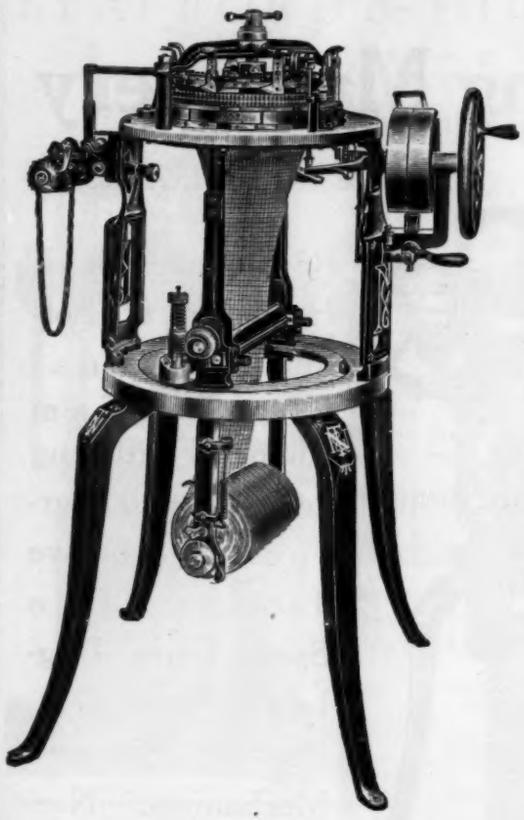
Hosiery and Underwear

Write for Catalog and Prices

CHARLES HART,

Reliance Machine Works,

FRANKFORD, PHILA.



NYE & TREDICK CO.

MANUFACTURERS OF

Circular Rib

Knitting Machinery

=FOR=

Underwear and Hosiery

Office and Show Rooms
718-720 Cherry St.,
PHILADELPHIA, PA.

Acme Hosiery and Textile Binder No. 30

A simple, inexpensive machine for Attaching Tickets on Hosiery Underwear, etc.

Uses a pointed staple. Cannot injure the finest Silk Hose. Is portable. Can be set aside when not in use. Is operated by foot power and has a patented WORK-HOLDING DEVICE, carrying one dozen or more pairs of Hose, keeping them in perfect alignment and presenting the tops in position to receive the tickets at least twenty-five per cent quicker than by any other method now in use.

For particulars and the address of the nearest agency apply to the manufacturers,

The Acme Staple Co.,

CAMDEN NEW JERSEY

Circular Rib Knitting Machinery

PRODUCTS

Underwear, Sweaters, Cuffs with Cut Welt, Selvage, or French Welt, Mantles, Collarettes, Toques, Golf Caps, Hosiery Tops, Skirts, Borders, Corset Covers, Button Stays, Mittens, Bandages.

FEATURES

Rectangular Slots, Hardened at Bottom, Sectional Caps and Cam Rings, Hardening and Ground surfaces, Sensitive Take-Ups, Two Speed Drive, Dogless Attachment, Positive Pattern Mechanism, Needle Guard and Protector, Automatic Stop Motions, Electric Cloth Cutters.

MANAGER

It is good to make a showing on first cost, but a knitting machine is not like a stock table. The knitting machine manipulates every inch of your yarn making first-class fabric, indifferent fabric or waste. This yarn costs **256 times** as much as the best machine, if the latter lasts fifteen years. Buy cheap stock tables if you must. They can't hurt your goods. But buy only the best knitting machinery.

Wildman Mfg. Co.

Established 1889 **NORRISTOWN, PENN.**

STAFFORD & HOLT

Builders of
CIRCULAR
Rib Knitting Machinery

For Knitting the Latest Style Fabrics.
FOR

Underwear, Sweaters Toques, Cardigan Jackets, Borders, Etc.
Also Builders of

Napping Machines

The Stafford and Holt Pineapple Stitch Machine is the Latest

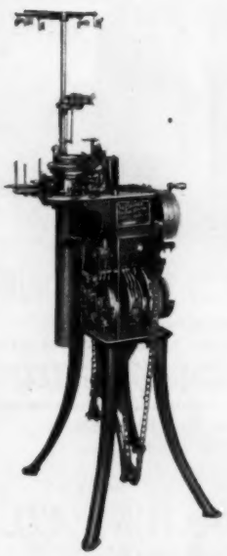
Write for Descriptive Circular

Little Falls, New York

"THE BANNER"
HEMPHILL'S LATEST

FULL AUTOMATIC MACHINE

The FIRST Practical Revolving Cylinder Machine on the Market.



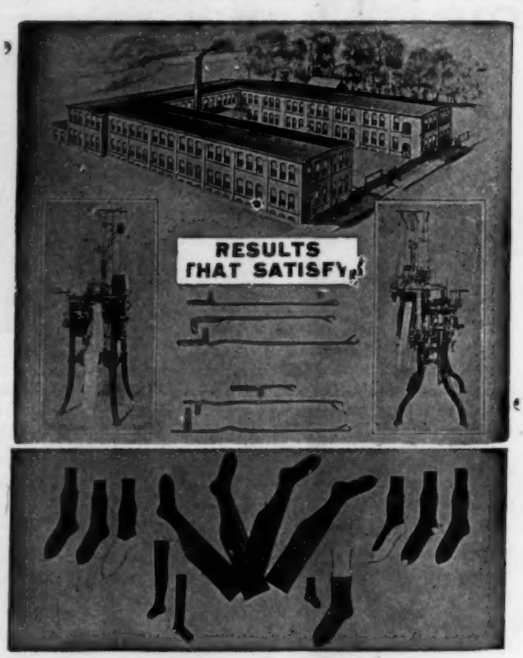
Built for either plain or split foot work, single or double feed. Adapted to manufacture hose with linen or mercerized heel or toe.

Also for Plaited Goods, Silk and String Work
High Splice and Double Sole
Some of the latest improvements include:
Accordion Stitch Tuck Stitch
All-round Drop-stitch
These Improvements are fully
AUTOMATIC
Largest Production
More Yarn Changes
Highest Speed
Simplest
Least Repairs
Produces a Superior Quality of Work

Average Production 100 Machines a Week. Over 2,500 Machines Sold and Delivered from Jan. 1st to July 1st, this year.

HEMPHILL MFG. CO.
131 Clay Street PAWTUCKET, R. I.

Quality of Product Secures for Our Customers



ASK THOSE WHO KNOW

Acme Knitting Machine & Needle Co.
Franklin, N. H.
Bourse Bldg., Philadelphia, Pa.

The Palmer Adjustable Thread Guide

For Ring Spinning and Twisting Frames

Easily adjusted.

Extreme accuracy and permanence of setting.

Cheapest of them all.

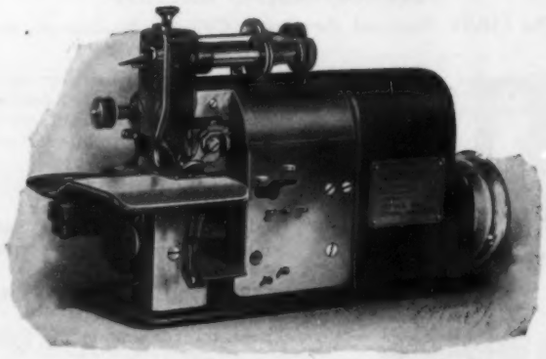
Mail guide-block for free sample.

Patented and manufactured by

THE I. E. PALMER COMPANY
Middletown, - - Connecticut.

THE MERROW

High Speed Overseaming, Overedging and Shell Stitch Machines



Our Class 60 Machines
For Trimming and Overseaming in one operation produce the strongest seams with the greatest economy.
USE STYLE 60S for welting Stockings, blind stitch.
USE STYLE 60HD for hemming bottoms of Underwear.
USE STYLE 17B or 22 for Bed Blankets.
STYLE 18 is for Horse Blankets.

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THE MERROW MACHINE CO.

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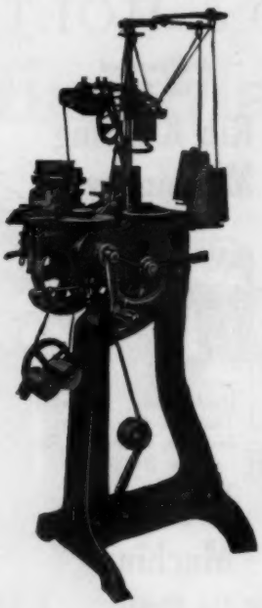
Knickerbocker Bld'g, 6th and Arch Sts., Philadelphia, Pa.
1019 E. Baltimore St., Baltimore, Md.



Quality AND Economy

INVINCIBLE

JENCKES KNITTING MACHINE COMPANY

PAWTUCKET, .: RHODE ISLAND
Philadelphia Show Rooms, 1211-1217 Filbert Street

A New System of Machinery For Producing Seamless Hosiery

Scott & Williams Model B

INCORPORATED

Replacing Former Model B

Five Yarn Changes.
Sectional slackening prior to the heavy yarn changes, thereby preventing cutting and waste.
Fabric also slackened where high splicing yarn is inserted, thus insuring narrow ankle and foot.

Scott & Williams

INCORPORATED

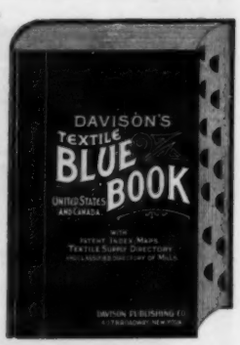
Model F

The most comprehensive machine ever offered to the trade.
Makes women's hose with integral welt—no sewing necessary.
Or will make women's hose with selvage top, using any kind of yarn from silk to carded cotton.
Makes half-hose without a transfer.
All dropped from the machine—looping alone required.
Anti-run-back course preventing ravelling from garter tears and other causes.
This machine may also be used for making string work, or half hose transferred in the old fashioned way.

Scott & Williams, Inc., 88 Pearl St., Boston, Mass.

Philadelphia Utica

Time is Money



and it is exasperating if consumed in finding any firm in a directory.

Such delays are obviated on the **BLUE BOOK**, owing to the 14 thumb index labels, which enable you to turn immediately to any section of the book.

The office edition is by far the finest work issued in the textile line; the paper, printing and binding being of the highest order, and shows that no expense is spared to produce a perfect book, while for accuracy, we do not claim to be ***as good*** as others but we believe our directory far excels them.

Anything can be sold the ***first time*** to a customer, but proof of its quality is whether he will continue ***to buy it for years.***

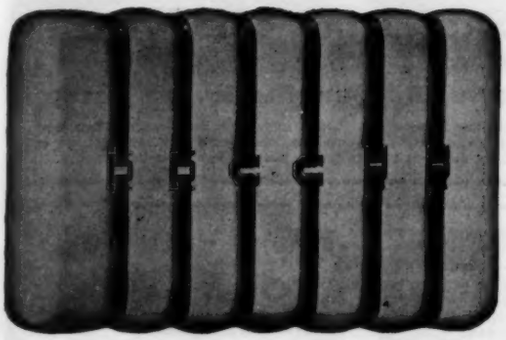
Many of the largest mills in this country and Canada have been buyers of the **BLUE BOOK** for twenty years or more, and if it suits them, it surely will cover your needs.

A full description of both the office and pocket editions sent on request, and nothing will please us more than to have you examine the 1913-14 edition just issued.

Office edition, 1,100 pages, price $4.00; pocket edition, 1,000 pages, price $3.00 delivered. Salesmen's directory, 400 pages, price $3.00.

DAVISON PUBLISHING CO.,

407 Broadway New York



Bale Shows Our Three Styles of Buckles.

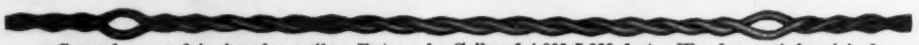
Acme Steel Goods Co.

Main Office and Works
2834-40 Archer Avenue CHICAGO

Eastern Branch, 151 LaFayette St., New York
Southern Branch, Tift Street, Atlanta, Ga.

Bale Ties and Buckles
Box Strapping
Corner Irons
Case Seals
Acme Galvanized
Twisted Wire

ACME
ESTABLISHED 1880



Spread every 6 inches for nails. Put up in Coils of 4,000-5,000 feet. Wooden reel furnished.

ELECTRIC SINGEING MACHINERY

FOR COTTON, WORSTED, SILK AND SCHAPPE YARNS AND WIDEGOODS

Economy, Quality, Hygiene

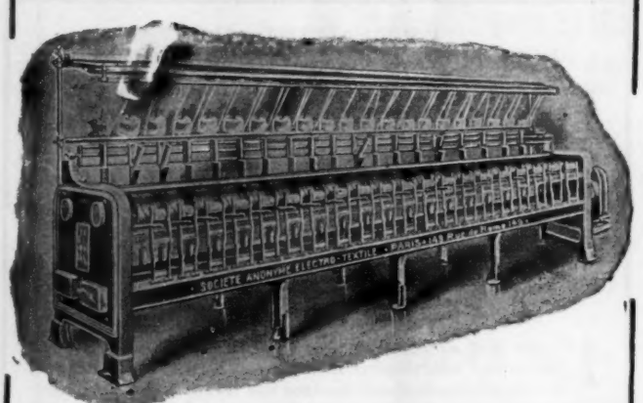
We lower your cost of production from 30 to 60 per cent.
We produce yarns of finer quality.
We produce yarns of better color.
We give you absolutely clean yarns and CLEAN SAFE WORK ROOMS.
Simple to operate.

The only machine that allows manufacturers to meet the demands of increasingly rigid legislation controlling the health conditions of the work-room.

SOCIETE ANONYME ELECTRO-TEXTILE

SOLE AMERICAN REPRESENTATIVE

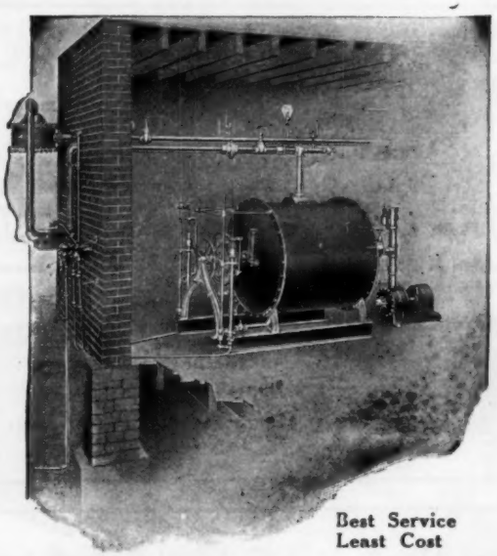
THEO. F. HUSSA, 136 Liberty St., **New York**



YOUR HOSIERY CLOTH AND YARN SINGEING

Can be done at less cost in less time, better and more uniformly by the gas produced by the

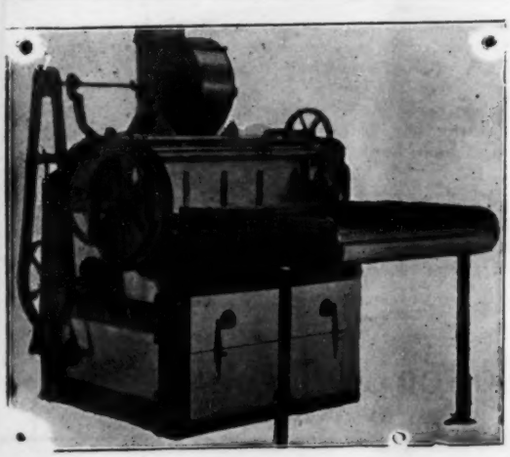
20th Century Gas Machine



Best Service
Least Cost

Clean, blue flame delivered under the pressure or force best suited for the weight and character of the goods you finish. No air mixed at burners. Write for proposition and catalog.

THE C. M. KEMP MFG. CO.
BALTIMORE, MD.



Schofield Patent Automatic Opener and Duster

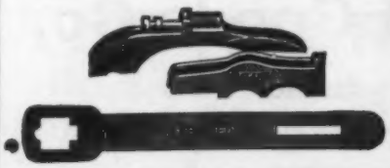
For opening and dusting Wool, Cotton, Linters, Hair and kindred fibrous substances.

"Schofield" intermediate feeds for Cards, Wool, Rag, Waste, Hair and Lumper Pickers, Automatic, Cone and Oldham Willows, Rag and Extract Dusters, Waste Pullers, Blamaine Lap Feeds, Curled Hair Pickers, etc.

WILLIAM SCHOFIELD CO.

Iron Founders, Textile Machinery Builders,

Krams Ave., Manayunk, Philadelphia, Pa.



DIXON LUBRICATING SADDLE CO., BRISTOL, R. I.

SOLE MANUFACTURER OF

Dixon Patent Locking and Stirrup Adjusting Saddles and Stirrups

The weight can be taken off and put on to the middle rolls, without stopping your frames, when long stapled cotton is used. The stirrup is always in place. No bent stirrup resting on rolls. Manufacturers of all kinds of saddles, stirrups and levers. Send for samples and prices. Spinners' Supplies in General.

CHARLES H. SCHNITZLER

Patentee and Sole Manufacturer of

THE PNEUMATIC CONVEYOR

For the handling of wool and cotton stock, rags, excelsior, jute and all kinds of fibrous material, wet or dry. Also spool elevators, steam heating and ventilating and mill work generally. Blower and fan work a specialty. This conveyor is patented. Beware of infringement.

Satisfaction Guaranteed

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Stock Motors Promptly Shipped

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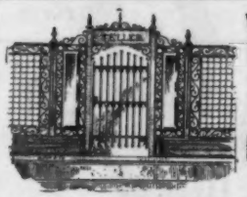

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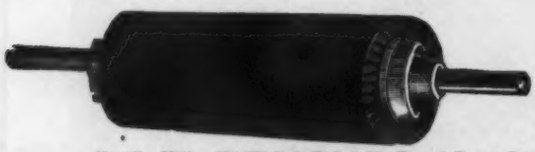

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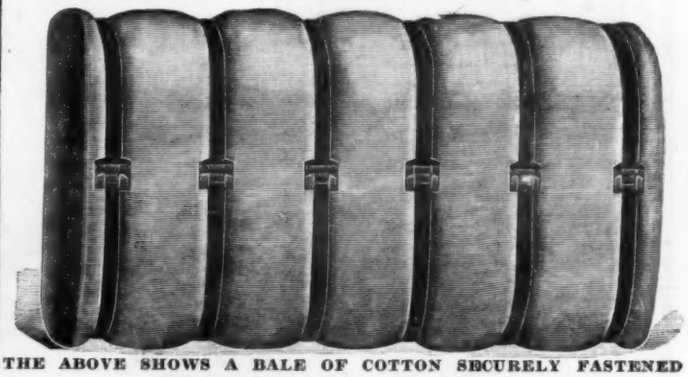

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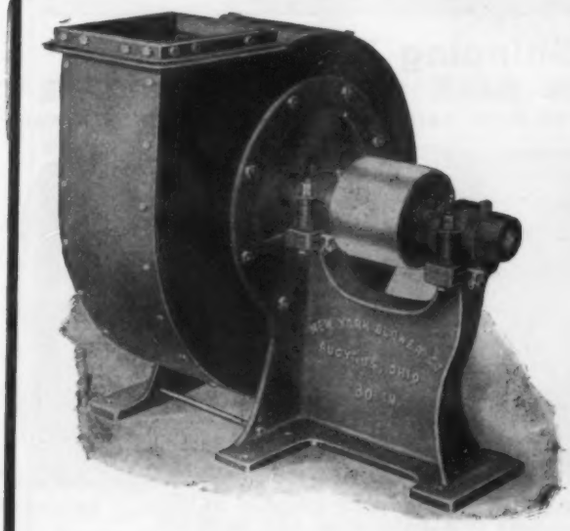

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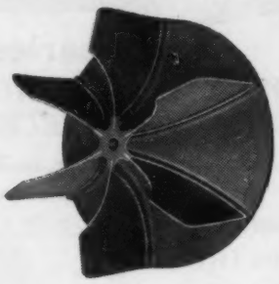

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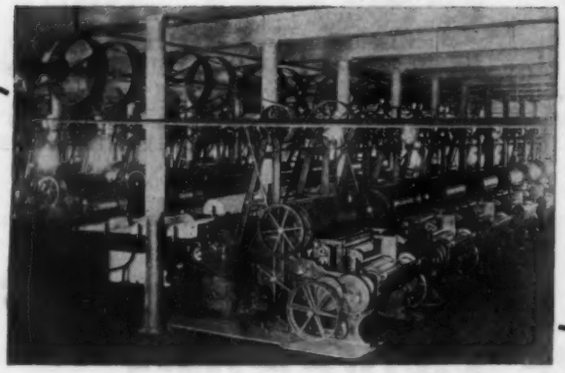

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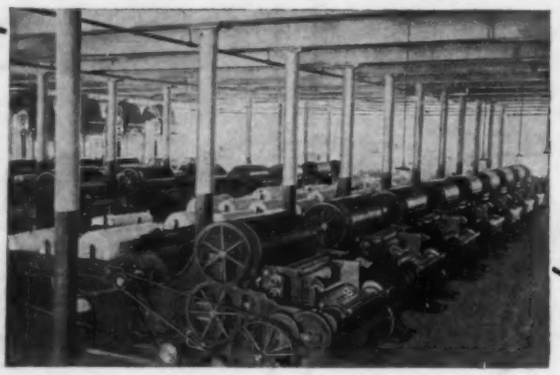

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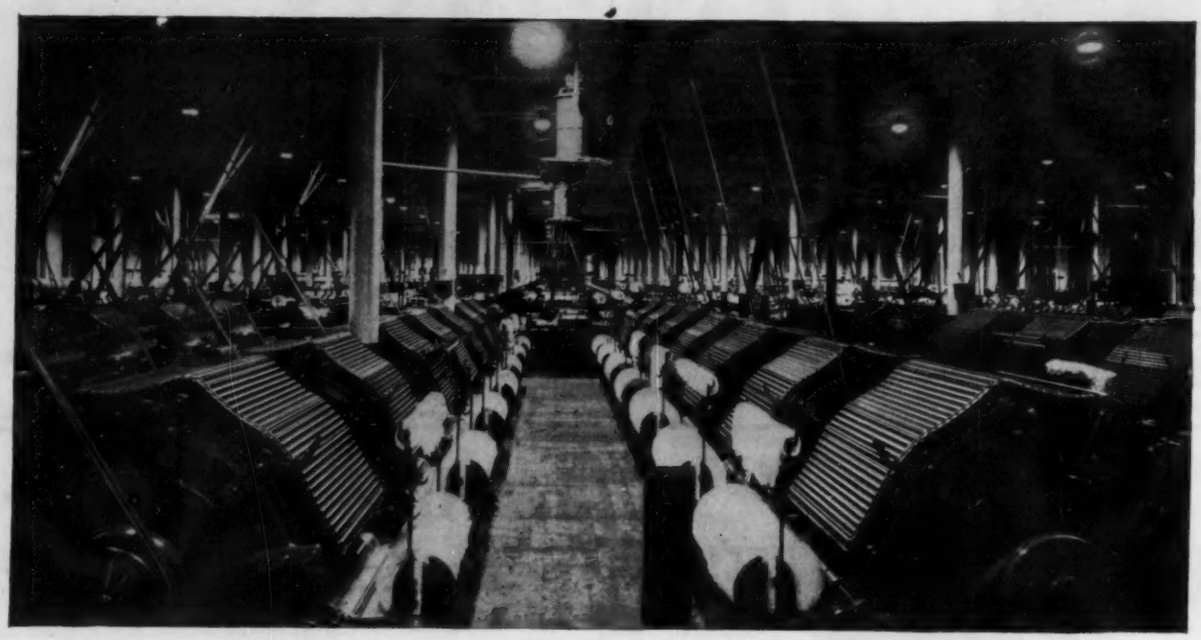

Photograph of Carding Room in a Southern Cotton Mill. 75-60 watt clear Edison Mazda Lamps are used, equipped with aluminum finish intensive distribution Holophane—D'Olier steel reflectors (A1-60).

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Fig. 2 shows in elevation the approximate location of extensive reflectors.

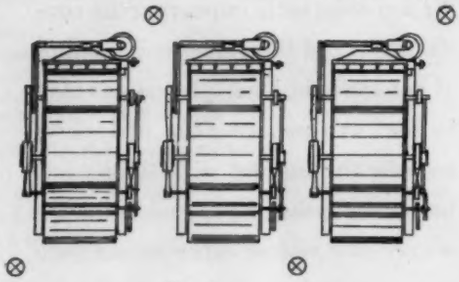

Fig. 1.

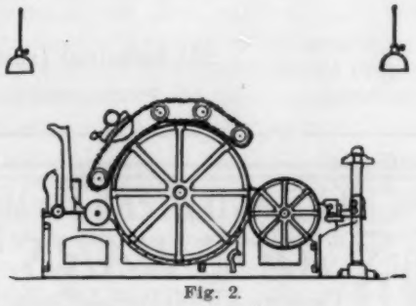

Fig. 2.

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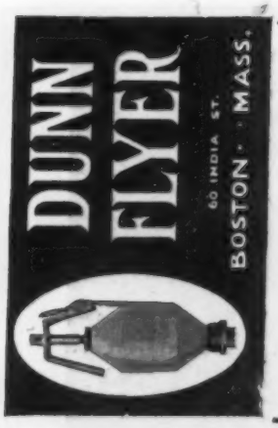

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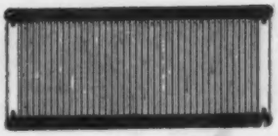
LOOM  **REEDS**

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ONE MORE COTTON TRUST.

Only last month we printed a brief resume of the action of the Attorney General of Arkansas in declining to issue a license to the Southern States Cotton Corporation, of Macon, Ga., because under the "blue-sky" law of Arkansas, corporations of this character are forbidden. While the efforts of this corporation are primarily to bring about 15-cent cotton and while its promoters claim they are receiving considerable support, there still remains enough independent cotton planters to organize still another cotton trust.

In a recent tariff debate in the Senate, Senator Smith, of Georgia, said: "I shall not stop to speak of cotton. We produce 850 million dollars worth of cotton. Of course the cotton grower has no protection. We do not ask it for him * * * but we say to the American cotton grower, 'The people must be clothed with cotton goods, and you ought not to ask to reach your hands into the pockets of the people who are to be clothed with your product and, seek a higher price for it by an arbitrary standard fixed by statute.'"

The cotton growers of the country do not ask for a protective tariff. Why should they, when two-thirds of the world's production is grown in the Southern states? What need, indeed, for a protective tariff, when all that is necessary to secure a higher price for these two million members of the National Farmers Union who are cotton growers is for them or their representatives to get together as they did on September 4th at Salina, Kansas, and vote to hold their respective portions of the cotton crop until it commands a price of 15 cents a pound?

It is reported that several of the leading cotton growers present desired the minimum figure at 17 or 18 cents, and pointed out that owing to tightness of the money market and the unsettled conditions in Europe and America, prices of all products will soar and cotton would no doubt bring that price if the members of the Union would hold out for it. Of course the mere fact that it is combination in restraint of trade makes no difference. A friendly Congress, upheld by President Wilson, supported the amendment of Representative Roddenbury, of Georgia, exempting farmers co-operative organizations from legal action under the Sherman Anti-Trust Law, by the simple expedient of limiting the expenditure of an appropriation authorized for the enforcement of that law. Therefore, they are at full liberty to combine and hold the staple for any price they see fit.

What an uproar it would make if the members of the National Association of Cotton Manufacturers in convention assembled voted en masse to hold the various classes of cloth manufactured until the price had increased three cents a yard over current prices. This would, of course, be impossible, as cotton manufacture is not a monopoly, as is cotton growing, but the result in such a case would be very easy to foresee. Even now, worthy senators, such as Stone of Missouri and Williams of Mississippi, arise in the senate chamber and declare that if there is no monopoly in cotton

manufacturing, there is at least exploitation. Has anyone ever heard of these or any other senators referring to such farmer's combinations as this 15-cent cotton "trust" as monopolies? It is entirely safe to presume that no one has and it is also safe to predict that no one ever will. Senators are now elected by popular vote and by the census of 1910 there were over 6¼ million farm operators in the United States.

The importance of this viewpoint is quite obvious to the layman but it will take several seasons of Chautauqua lectures to educate him to the point where he can understand the justice of such methods.

MAKING WELFARE WORK EFFECTIVE.

Some manufacturers, who are clever enough to make a big success of their business, make a mistake when they turn from the mechanical side of their plants to the human factor, and attempt to bring the latter up to the same degree of efficiency to which textile equipment has been raised. They know that their machines can be relied upon to accomplish certain things; that doing this is a demonstrable, mathematical proposition, about which there is no question whatever. It is another case of two and two making four.

In dealing with the help problem, and in striving to bring a better condition into existance, the millman who attempts to introduce a similar equation, without any unknown quantities, is certain to meet with trouble. In the first place, labor is not uniform and standard, and in the second place, human beings must be studied individually, in order to get results.

In spite of these facts, however, one frequently sees a manufacturer wrestling with the problem of getting better help, more loyal help, and more permanent help, much as he would wrestle with a problem in the power plant or involving the operation of his spinning machinery. He deals with it along mathematical and exact lines, endeavoring to introduce certain factors, which, added to certain other quantities, will produce a definite and measurable result.

There's where the trouble comes, of course. Results of that kind are intangible and hard to measure, and cannot be calculated in advance. And the plan which worked in one town will not necessarily work in another, in spite of the fact that a machine which operates excellently in one mill usually turns out to be equally good in another.

A group of textile men recently had an informal meeting, and the subject of improving the help came up. The conversation turned to all sorts of welfare work that had been undertaken by various concerns, and the interesting part about it was a violent difference of opinion as to whether the plan is worth while.

One man, who had evidently failed to make the scheme work at his mill, said very positively, "No, no more welfare work for me. I'm convinced that it does more harm than good. Instead of appreciating our efforts, our employees have shown that they don't want to be treated like human beings, and consequently we intend to handle them on a different basis hereafter. It's a waste of time and money to try to improve conditions."

Yet, a few moments later, another mill-owner, who had been listening attentively to the statements of the others, said quietly that he believed welfare work was the one great method of solving the problem.

"Our employees are the most loyal set we have ever seen," he said, "and have shown that they will stick with us under almost any circumstances. We have tried to treat them fairly, and I believe they know it. We have endeavored to make their surroundings attractive and agreeable, so that girls and women would want to work for us, and I think we have succeeded there. Altogether I am well pleased with the results we have secured from the various kinds of welfare work we have undertaken, and I believe that we have largely solved the labor problem."

There are two diametrically opposed opinions. Which one is correct?

An analysis of the cases cited may be worth while. The first undertook the sort of work he did admittedly to stem the tide which was flowing against him and to hold labor which was being lured to other superficially more attractive classes of work. The mill owner evidently expected the provision of a rest room and similar devices to meet at once the conditions which had been gradually developing, a development covering several years, probably, and when they did not, he was disappointed.

He had erected and equipped at some expense a building to be used for social purposes. A place was provided where young women might receive their friends, and a boarding-house was run in connection with it. The prices for board were low enough to prove an attraction. The manager of the plant admitted that the boarding-house had to be closed, finally, because there were no patrons.

The reason came out when he outlined some of the rules and regulations. It turned out that he had been trying to have his employees comport themselves like attendants at a young ladies' finishing school, and when they refused to do so, the plan collapsed. Many of his workers were of foreign birth, and had customs regarding social intercourse which were different from those prevailing in America. Unwillingness or inability to understand and appreciate their viewpoint led to the adoption of what must have seemed to them obnoxious rules, and rather than have their liberty interfered with they promptly provided board in another place.

Anyone studying the proposition from a human standpoint, and not as a problem in factory operation, would have seen this at once; but the head of this mill, who felt that he had called upon a panacea which had turned out to be a false alarm, expected the rest room to work like "Open sesame," and was accordingly convinced that there was nothing in welfare methods when it failed.

The concern which reported having made good with plans of this kind had been carrying on some work in this direction for a long time before the adoption of more ambitious plans. For instance, it had built houses and helped its employees to purchase them, thus insuring their permanent residence in the community; it had even carried on a certain amount of religious work, cooperating with the Young Women's Christian Association in holding weekly services at the mill; and it had shown in various other ways a real interest in the welfare of its employees, and consequently, when it put on foot a plan for a social headquarters, to be used by the girls as a reading room, for dances, for lunch, and for various other recreative matters, the employees took to the scheme like the proverbial duck to water. They used the room, had a good time and showed frankly that they appreciated it.

The difference in the result was largely a difference in

the point of view of the owners of the mill. The one expected welfare work to be a sort of touchstone, with immediate relief from labor problems resulting from its application; the other recognized the establishment of a rest room as just one feature of its efforts to improve the conditions of its employees, and did not expect colossal results. It got, however, all that could have been desired in the way of a strengthened *esprit de corps* among the workers in that mill.

The same condition prevails in regard to the handling of financial matters. Some mills have undertaken savings bank plans in order to encourage the help to save as much of their earnings as possible. One Tennessee mill recently reported having $48,000 of its employees' money, on which it is paying 5 per cent interest. Others which have used the plan have failed to do anything with it, not getting the interest and cooperation of their employees in sufficient measure to lead anywhere.

In connection with the use of profit-sharing plans, the problem is very similar. The employer who expects that an announcement of an intention to divide the profits will immediately convert his help from a more or less disorganized and apathetic lot into an enthusiastic, cheerful and hard-working set, all laboring together for the good of the institution, is expecting more than ordinary clay is usually capable of producing; but the manufacturer who uses the plan with a large degree of common sense injected into it, neither relying on it to produce wonders nor turning it down as not worth consideration from the standpoint of improving labor conditions, will usually find that he is making more headway with it than a lot of others.

To get down to the brass tacks of the matter, mill hands are human beings, endowed with brains and emotions. They can see through a hole in a mill-stone; and they can distinguish between a real and sincere endeavor on the part of their employers to assist them to a better condition, and a calculating desire to use a device to increase profits, masquerading under the name of "welfare work," for the benefit of the employer only.

That is why it is impossible to get permanent results from the use of a single feature of welfare work. It must be part of a connected plan and a continuous policy on the part of the manufacturer. The latter must realize that while helping his employees will ultimately benefit his own business, helping them should be made the end, and the means; for if employees come to the conclusion that the efforts of the company to do this, that or the other thing for them are altogether with an eye on the resultant dividends, the response is not likely to be too enthusiastic.

Welfare work has to do with the welfare of the laborers, not the welfare of the dividend account; and while the latter invariably gets the benefit from honest efforts in the direction indicated in the long run, that benefit should be submerged, even in the mind of the manufacturer.

AN IDLE RUMOR.

Director H. Will Nelson, of the Mississippi Textile School, states that the rumor that this progressive and up-to-date school has been closed is not founded upon fact. The school is neither closed nor likely to be in the near future. On the other hand the interest which we understand is being manifested in this school by many members of the Mississippi legislature and by the textile interests of the state augurs well for its future.

THROUGH FOUR ADMINISTRATIONS.

Former commissioner of patents, Edward B. Moore, and W. H. C. Clarke recently announced that they have entered into a partnership for the practice of patent, trade mark and copyright law in New York City and Washington, D. C. This recalls the record of long and efficient service rendered by Mr. Moore. He was assistant commissioner of patents under President McKinley and commissioner under Presidents Roosevelt, Taft and Wilson. He represented the patent office at the Paris Exposition of 1900. Following this service he was given credentials of a special ambassador and represented the United States at the international conference in Stockholm in 1908, following which he visited the countries of Europe, personally negotiating treaties affecting industrial property which he had prepared by direction of President Roosevelt. On a similar mission for President Taft he negotiated conventions with twenty South American republics. In 1911 he was designated by President Taft to be chairman of the American delegation to the diplomatic congress known as the conference at Washington, held under the treaty of Paris of 1883 for the protection of industrial property. Elected temporary president of that body, he presided at the opening of the conference where diplomatic representatives, noted scientists and the commissioners of patents of forty nations were in attendance. His service in this capacity makes him vice-president of the next conference to be held at the Hague. Mr. Clarke is a member of the United States supreme court bar and has practiced extensively in the federal courts throughout the country.

A NEW DEPARTMENT.

After working over the preliminaries for some time the Georgia School of Technology, at Atlanta, has decided to establish a School of Commerce as a "developer of executive efficiency."

This school of commerce is to take the place of the old system of apprenticeship and is expected to overcome the apparently unbridgable gap between business and education.

The courses in commerce and finance are intended to have a practical value for the student looking forward to a career in any line of business; to teach the principles which underlie all business operations; to bring to his attention some of the problems which every business man must solve; and to furnish him with definite information which will aid in the solution of such problems. These are arranged to include accounting, managerial efficiency and commercial law.

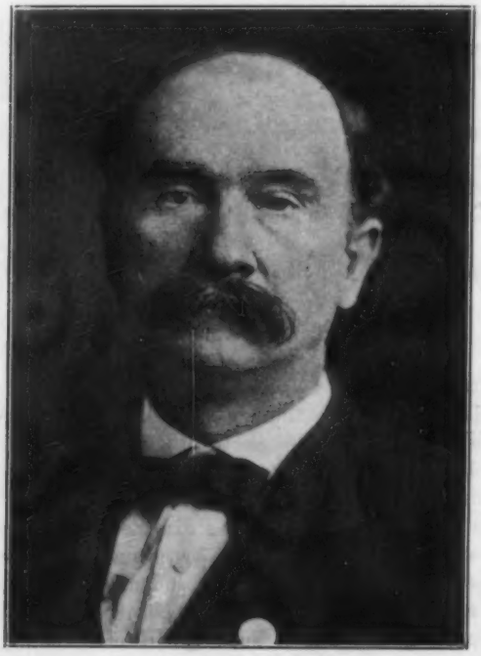
This idea, if carefully carried out, will strengthen a very apparent weakness in former educational methods. It would be well worth while, however, for this and other similar schools, which are training young men for directorial positions along various lines, to give serious thought to the suggestion made in these columns last month concerning the adoption of a human nature department, the need for which is noticeable among young graduates of almost every class.

Every victory over discourtesy is well worth the effort, and makes a man bigger and stronger, and a more desirable employee. It brings him nearer promotion, and raises him in the esteem of his family and friends.

SOUTHERN TEXTILE ASSOCIATION—MISSISSIPPI SECTION.

(*Special Correspondence*).

A short time ago a call was issued by First Vice-President C. H. Goodroe, of the Southern Textile Association, to all those interested in the further development of the textile industry in the states of Mississippi, Tennessee, Alabama, and Texas, to meet at the Southern Hotel at Meridian, Miss., on Saturday, September 6, for the purpose of forming the Mississippi Section of the Southern Textile Association. There was a splendid delegation present, and Secretary A. B. Carter, of the Southern Textile Association, was present to assist Vice-President Goodroe in the organization of the section. Vice-President Goodroe spoke in glowing terms of the hopes he had for the future development of the textile industry in Mississippi and never in the history of the South has an organization been formed where greater enthusiasm was evident, or where better hopes of permanent results were to be seen than was the case at this meeting, and the confident words of Mr. Goodroe will long be remembered by those present. Immediately after organization the following officers were elected: J. S. Stroud, president; J. B. Meacham, vice-president; H. Will Nelson, secretary, and H. C. Moore, treasurer.



C. H. GOODROE, 1ST VICE-PRESIDENT, SOUTHERN TEXTILE ASSOCIATION.

An address of welcome was delivered by Mayor Parker of Meridian, to which Secretary Carter responded in his usual able manner.

T. L. Wainwright, president of the Stonewall Cotton Mill, at Stonewall, Miss., spoke on the labor question and pleaded for a better understanding among mill managers. He urged that an agreement be made among mill men regarding the payment of transportation for bringing operatives from other mills. He also emphasized the great value of good houses, and good pay for work accomplished, and stated as a fact that if these things were properly attended to, the problem of the lack of help would become a minor matter.

After a brief discussion among the members, H. Will Nelson, director of textiles at the Mississippi Textile School, spoke on the relation of the textile school to the upbuilding of the industry in the state. "No man can hope to develop any industry and he cannot even improve the people he comes in contact with, whether as overseer, superintendent, agent, or anything else, unless he has a vision of better things himself and a confidence, trust and belief in what he is trying to do," said Mr. Nelson. "If we believe that there is a future in the textile industry for this state, there will be developments, because we will do that which will tend to uplift the work people through education and in other ways, proving to those who do not see, as we see, the great value of the state for this industry." Mention was also made of the recommendation which the president of the A. & M. College expects to make to the legislature, and which, if adopted, would help very materially in the development of textiles. Assistance in this connection was the work of the members of the association, and which would ultimately mean a million spindles, where there are now less than 200,000. At the suggestion of Mr. Goodroe, a motion was passed with enthusiasm that the legislative committee petition the legislature to encourage the work of the textile school at the A. & M. College.

A. B. CARTER, SECRETARY, SOUTHERN TEXTILE ASSOCIATION.

Dr. Knoblin, of Yazoo City, delivered an address on the sanitary condition of the mill and village. This address was the means of showing to the members what could be done with judicious efforts by the physician and surgeon who had the interest of the people at heart, and the best endorsement of the work being done at Yazoo City, perhaps, was the invitation extended by Dr. Knoblin for everyone to come and see for themselves what had been done. "Why not figure on the physical development of the help in the mill as well as on the production of yarn and other products from that help?" said Dr. Knoblin. "If the results could be seen and understood it would be a big surprise to many people and would also be the means of silencing much of the present criticism of the textile mills."

Vice-President Goodroe spoke on the value of the textile mills to the people who live in the mountains and way off in the country, and went on to explain how he had taken

this class of operatives, people who were merely existing, and taught them how to earn a decent living, and showed by results where many were becoming sturdy citizens of the state thereby. He assured the members of the association that there is plenty of labor for the mills of the future to be found in the rural districts, and claims that he has proved this to his own satisfaction in his own mill. Superintendent H. C. Moore, of the Magnolia Cotton Mill, then spoke on the child labor question, and stated that in his opinion the law was too drastic. He claimed that to prove this to the people who see only one side of these things, and to the legislators, that they should be advised to visit the mills and see the inner workings, also to make several visits, so that all manner of conditions could be understood, and then to compare these conditions with those of other industries. The speaker strongly urged the bringing up of mill problems in the meetings, as they would be of great help, especially to the younger men.

The legislative committee, composed of E. Mitchell, D. J. McClellan, and W. Z. Smith, were advised to represent to the legislature that a 60-hour per week law be so arranged that the mill people could have Saturday afternoon at liberty was far better than the present arrangement of 10 hours each day.

A telegram was received from L. L. Arnold, editor of COTTON, regretting his inability to be present, and assuring the members of COTTON'S support, while wishing for the meeting unqualified success. This telegram was read to the association and received with appreciation by its membership.

After an excellent banquet at the Southern Hotel, the meeting adjourned to await the call for the next meeting.

Among those present were, J. B. Meacham, superintendent, McComb City; H. C. Moore, superintendent Magnolia Cotton Mills; C. H. Goodroe, superintendent, Yazoo City Yarn Mills; T. L. Wainwright, president, Stonewall Cotton Mills; L. S. Stroud, superintendent, Meridian; J. F. Clark, general manager, Meridian; W. N. Wilson, overseer, McComb City; J. W. Greenlea, overseer, Magnolia; A. K. Wallace, shipping clerk, Yazoo City; A. C. Canterberry, overseer, Meridian; R. F. Goodroe, master mechanic, Yazoo City; R. L. Sherrod, Yazoo City; A. W. Mungall, dyer, Meridian; J. A. Fowler, Meridian; W. Z. Smith, yarn superintendent, Yazoo City; A. T. Cain, overseer, Meridian; E. W. Cargill, overseer carding, Tupelo; P. E. Adams, overseer, West Point; H. Will Nelson director Mississippi Textile School; T. S. Garner, overseer, Stonewall; A. B. Carter, southern representative Victor Shaw Ring Traveler Co., Athens, Ga.; Thos. Goodroe, overseer, Yazoo City; J. W. Horner, representing W. H. Bigelow card clothing, Charlotte, N. C.; G. J. McClellan, superintendent, Tupelo; Edgar Mitchell, superintendent, Stonewall, and O. E. Moers, manager, Meridian.

Secretary A. B. Carter, of the Southern Textile Association, is issuing handsome certificates of membership in black and gold to all members of the Association who are in good standing. One of these certificates suitably framed and hung by the overseer's desk in the mill, indicates to all observers that this overseer is a wide-awake, progressive member of the Southern Textile Association, and almost assures that his room is being run in accordance with the most approved standards of the times. If you haven't received your certificate yet, you had better take it up with Secretary Carter!

THE ART OF INDUSTRIAL MANAGEMENT.

In the recent article on "Training Operatives," William Shaw places the blame for lack of training largely with the management and indicates the proper methods to apply in several specific instances. At the last annual meeting of the American Society of Mechanical Engineers, the majority and minority reports of the sub-committee on administration were presented for discussion. The following extracts from that part of the discussion submitted by H. L. Gantt are directly applicable to the manufacture of textiles and in many ways support the contentions of Mr. Shaw in regard to the training of operatives.

"The implication in the report of the committee that the development of methods and the training of workmen are functious of the management has to my mind not been sufficiently emphasized," said Mr. Gantt. "The piece work system as usually operated and most of the premium and bonus systems in general use do not recognize training as a function of the management, and may be classed as individual effort systems. They have undoubtedly accomplished some results in the past, but we have now reached the stage in our complicated industries where more than individual effort is required. Individual effort may be so hampered by environment as to make progress impossible, and to cause the workman to become so discouraged as to give up whatever effort he may be making. On the other hand, if the management determines that a certain degree of efficiency is attainable, accepts the responsibility of training workmen up to the point necessary to obtain that efficiency, and provides means for obtaining it, we have an entirely different condition.

"This view of the subject is so opposed to that held by most managers, superintendents and foremen, that it is with great difficulty that we can get them to accept it, and the time needed to bring them around to this viewpoint is far greater than most realize. There are many reasons for this, and the fact that a man does not instantly accept a new proposition, which is to his mind revolutionary, should not for one minute be held up against him, for a strong man who has been successful in following one line of action, justly regards an entirely different line as being inferior to one which has brought him his success.

"Fig. 1 represents the work of women winding yarn in a cotton mill after the system had been in effect one month, at which time three operatives were regularly earning a bonus. At the start, one of the best workers was offered the opportunity to perform the task and to earn bonus, but she felt the task was too severe and did not wish to try. A week later, however, she did begin the work and made her bonus right along. Some of the people in this room were young girls who apparently had but little interest in the work, and made practically no effort to earn their bonus. The older and more staid ones, however, took hold promptly and the younger ones gradually dropped out. The newcomers at first spent three or four weeks before they actually earned the bonus. As, however, those who were not interested in earning the bonus gradually disappeared, the habit or fashion in that room came to be—attend to your job and earn the bonus. The newcomers then in many cases earned their bonus from the very first day. This chart is dated March, 1909. Fig. 2 shows a chart of this room as it exists today and is reproduced by permission of the treasurer of the mill.

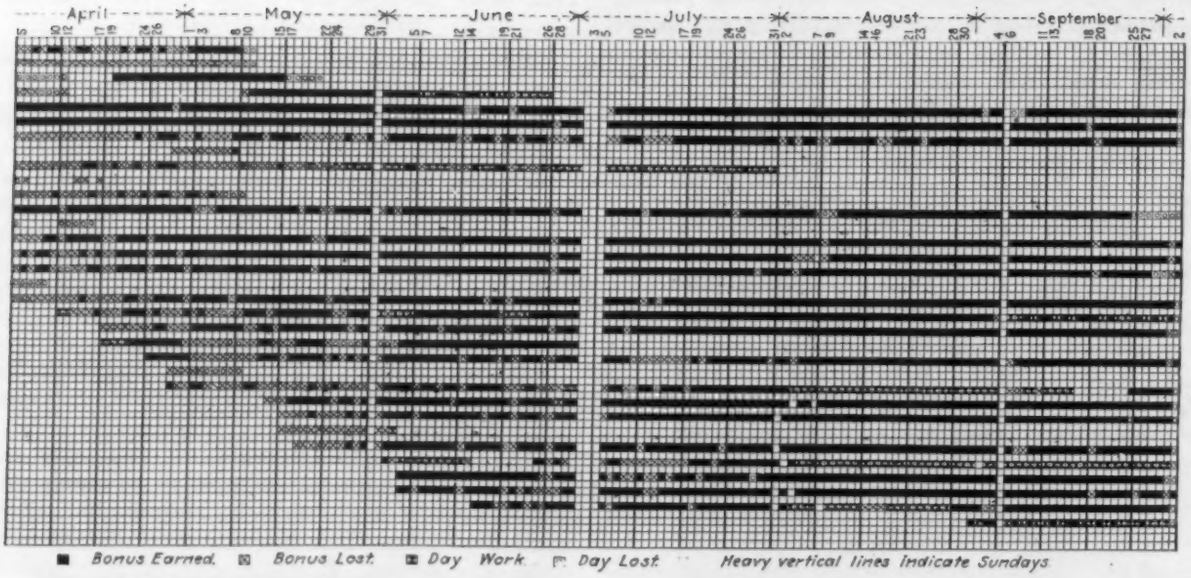


FIG. 1 CHART SHOWING RESULTS OF BONUS SYSTEM: WOMEN WINDING YARN IN COTTON MILL, 1909

Each line is the record for one worker. Note how much more quickly new workers put on in June began to earn bonus than did those in April or May

"Some months ago the Industrial Workers of the World made an attempt to cause a strike in all of the mills in the town where this mill is situated, and actually succeeded in shutting down some of the mills for several weeks. In this mill, on which a strong attack was made, only 60 out of 600 employes were drawn out, and the management had no difficulty whatever in filling all their places in a few days.

"Fig. 3 represents the work of the girls in a worsted mill. The best workers were put on bonus work first. Their improvement is noticeable. It was nearly three months before all were put on this work. The poorer ones failed at first, but on the last day shown on the chart, all of the

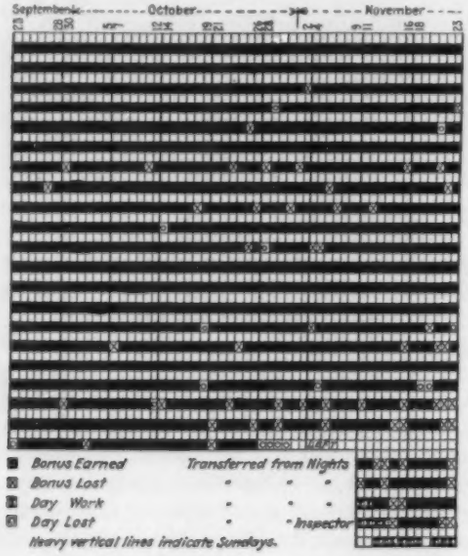


FIG. 2. CONDITIONS EXISTING IN 1913 IN THE DEPARTMENT REPRESENTED IN FIG. 1.

poorer workers earned bonus. During the period from April 15 to July 10, one hundred and sixty-one girls had been put on bonus work, and 21 out of this number had for one reason or another, left the employ of the company. The reasons were as follows: Four left on account of bad health or were dissatisfied; one married; one entered a convent; one went to work at the mountains for the summer; five left town, and nine were discharged.

"One of the obstacles nearly always encountered is the opposition of certain people in authority who, having once expressed their disapproval of these methods, feel it their duty to oppose their introduction to as great an extent as possible. Their original arguments having failed, the argument that we were overworking the girls was advanced, and they insisted on being allowed to put on piecework, some of this work which was in another building, and which had not yet been put on the task and bonus system. Accordingly, on June 19, their piecework was started. On July 11, the date of the report, 19 out of a total of 53 girls in this building had left. In other words, almost one-third of the girls who were put on piecework according to the request of the man who had their interests most at heart, left in three weeks. In the case of our bonus workers, approximately one-eighth of the girls left in 15 weeks.

"In 1904 I put this system into a shop making packing boxes. A few weeks ago I had word that it was running substantially as it was started, and that nearly all of the original bonus workers were still there.

"Fig. 4 represents the making of sheets and pillow cases and the work of starting the task and bonus was done by a man who has been connected with me, but who was doing this on his own responsibility. I was not personally in touch with this work when it was done. The factory was shut down on a number of days, November 28 (evidently Thanksgiving day) and then on Christmas and all Wednesdays and Saturdays for the next two weeks. The work started off very well, but the rush to get people on bonus on November 30, evidently upset things, for a number of workers are back on day work. This was probably due to the inability of the task setter to set tasks on new work fast enough. Just before Christmas week the same condition obtained, and after Christmas there was not enough work to keep the factory running full. However, by the middle of January, those who had bonus work were beginning to earn their bonus pretty regularly, and by February 10 the

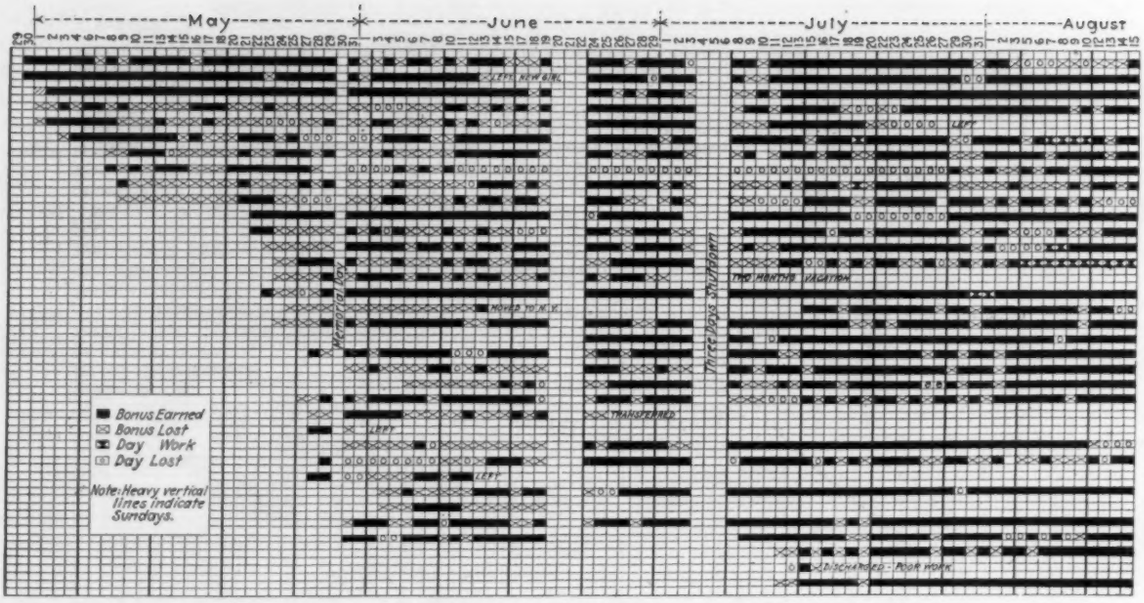


Fig. 3 Record of Work in Worsted Mill

Each line represents one worker. This is a sample chart for one room. There were several other rooms

number of workers were just about large enough so that each could be supplied with a full amount of work. From that time on the work went smoothly.

It is evident from this chart that the management has its part to play in supplying and teaching workers, and that the trouble was not with the workers, but with lack of proper balance in the managing department. The fault, however, is a natural one, for when the man responsible for the output finds the advantage he can obtain by the task and bonus system, he almost invariably insists on putting as many people on bonus as possible, with the result that he finds he cannot supply all the workers properly and that numbers of them have to be put back on day work.

"You will ask why the task setter does not explain this to the superintendent and make it clear that that is the wrong way to do. I can only say that no amount of explanation on my part, or that of my representatives, seems to have much effect, and we have about come to the conclusion that the best way to do is to let them make their mistakes and find out, then the question is settled once and for all time.

"Fig. 5 is a particularly interesting chart, inasmuch as

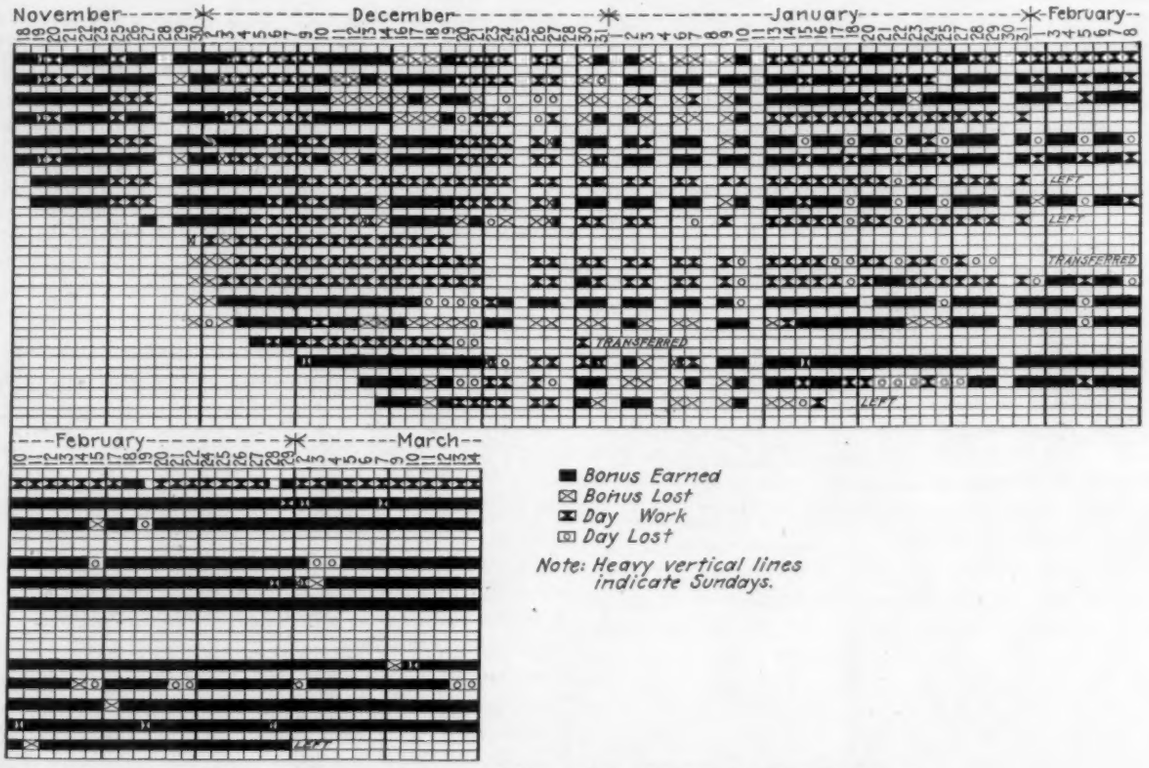


Fig. 4 Record of Work in Mill making Sheets and Pillow Cases

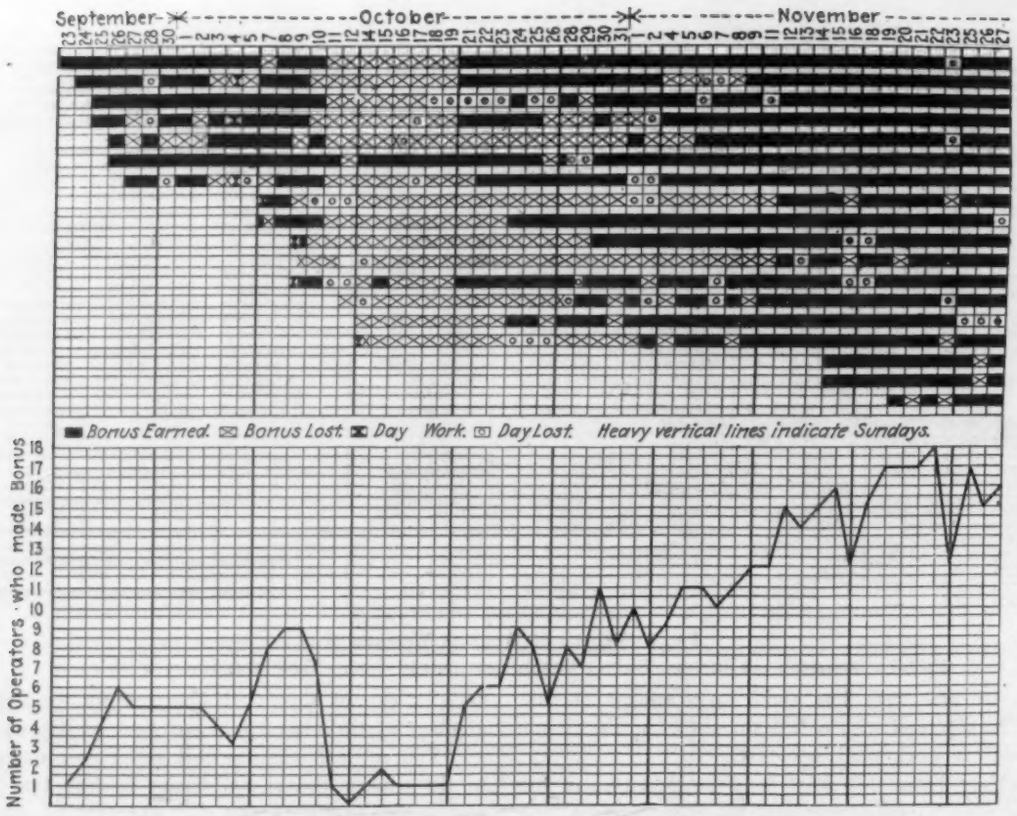

September
October
November
Bonus Earned. Bonus Lost. Day Work. Day Lost. Heavy vertical lines indicate Sundays.
Number of Operators who made Bonus

FIG. 5 CHART ILLUSTRATING BONUS WORK IN FACTORY WHERE THE EFFORT WAS MADE TO INCREASE THE OUTPUT TOO RAPIDLY

it is the most recent—the development is still going on. It is reproduced by the courtesy of the manager. In this the work went very well until we began to push it too fast. When the desire to get an increased output overcame the conservatism with which it is necessary to establish a new method, those workers who were last put on influenced the others not to perform the task, and one day nobody made bonus. One girl, however, felt that she needed the money, and continued on with the work. The others showed their hostility toward her in a number of ways, but she still persisted. After they had ceased to try to do the work for three or four days, several of the girls sent in their notice that they were going to quit. They were evidently trying to raise an issue, but inasmuch as the management ignored it and went about its business of getting conditions so perfect that the workers could have no cause whatever for not trying to earn their bonus, they were unable to get the issue accepted. At the end of eight days, some of the girls became willing to try again, and from that time on the number increased. For some time past the applications from other girls to work on task and bonus has been so great that we have been unable to provide proper conditions and to set tasks for them fast enough.

"The question naturally arises with respect to the charts as to the ratio between the amount which is being accomplished now and what was accomplished previous to starting in with this work. In order to make these comparisons clear, we devised what is called a Percentage Chart. On this the average production previous to the installation of our methods is called 100 per cent. Our new production may be two, three or four times that amount. The wages paid before the work was started are also rated at 100 per cent. The new wages would be an increase over the old standard, usually of from 30 to 50 per cent, and the wage cost measured in the same manner would be distinctly below the previous wage cost.

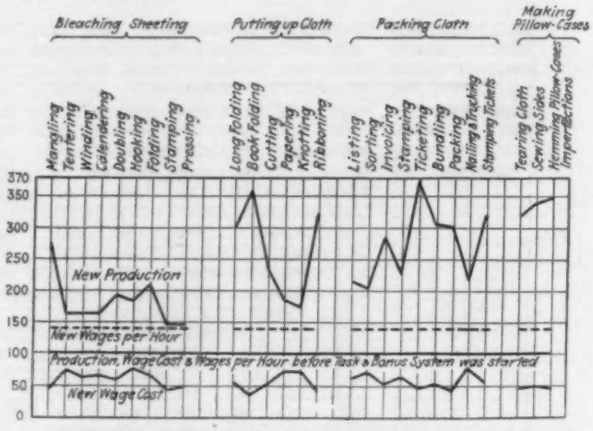


FIG. 6. ACTUAL RESULTS UNDER THE TASK AND BONUS SYSTEM AFTER MORE THAN TWO YEARS' OPERATION. EACH VERTICAL LINE REPRESENTS A DIFFERENT OPERATION.

"Fig. 6 shows these ratios with regard to work done several years ago in a bleachery in Rhode Island. Each of the vertical lines represents a different kind of work. The horizontal black line marked 100 per cent, represents the amount of work which was done on each of these operations previous to our investigations. The upper lines represent the amount of work now being done, compared with what was

previously done. The heavy black line marked 100 per cent also represents the previous wages paid, and the dotted lines above it represents wages now paid. The 100 per cent line also represents the present cost. The increase in product is around 200 per cent, and the decrease in wage cost is approximately 40 per cent, while the increase in wages is also 40 per cent. *It should be borne in mind that this increase in product is not due solely to the work of the operative, but also to more careful study and cooperation on the part of the management as well."*

COTTON MANUFACTURING IN RUSSIA.

(*Contributed Exclusively to* COTTON)

BY W. READ-BARBER.

Cotton manufacturing in Russia is an ever-increasing, ever-growing industry; it will become even more so when the cotton grown in South Russia becomes better marketed. The greatest amount of cotton used is of American growth, but probably in the near future, and when the supply of Russian grown cotton is greater, there will be less American used.

Russian cotton is a good, clean, lustrous cotton, about 1⅛-inch staple, and to all appearances could be classed with a good American. The machinery is all English, with English management, and English overseers. It takes about three Russian workmen to do the work one English workman would do; this is a big drawback, since the overseers have so much work to do, and so many hands to look after, that there is more spolied work than there should be. The women are proportionate to the men regarding their working capacity. The operatives therefore are not as good as obtainable in other countries; in fact, I think they are the very worst. This necessitates having good overseers, and again the overseers are greatly handicapped for the first two or three years, on account of the difficult language to be contended with.

All this entails more work for the manager or superintendent, and the very difficult conditions which such a manager has had to contend with, make him a man fit to go to any country, and able to manage any mill in the world.

It is impossible to get many operatives to stay more than three years, as they live on next to nothing, and as they get rather good wages in the mill in comparison with other work, with their savings, they are enabled to go to their villages and live in ease. This, of course, means the constant training of new operatives, which to any concern is an handicapping practice, making it very difficult to keep up the regularity of the quality of the goods.

Mostly gray cloth is woven, although there are ginghams, stripes, checks, and plaids, to a small extent. There is also a lot of thread making, and this accounts for a large amount of the spinning. The hours worked are from 6 a. m. to 6 p. m., with one hour and a half for dinner, and no stoppage for breakfast; Saturdays from 6 a. m. to 2 p. m., without any stoppage. The hour and a half principle is not a good one, since there is a lot of dodging at the time for breakfast which, of course, has to be taken while the machines are working. It also accounts for a lot of spoiled work.

There is also a lot of administrative work, caused by the Russian passport system, which has no material benefit for the manufacturers; in fact, there is quite a lot of "red tape" business with the government and the police, and since the people are ignorant, and uneducated, the whole work falls on the office staff, thus increasing the cost of administration.

The Russian peasants are totally unprovided for by the government in regard to education. This also means an hindrance to cotton manufacturing. Then, there is hardly any honest business transacted, as whatever business is done, the manager or salesman in nine cases out of ten, wants some commission as does also his buyer, and this means many times as much as 10 per cent in this part of the transaction. Also in the mill supplies very often these things occur. At the same time cotton mills can pay from 10 to 20 per cent dividends, and this is the general thing for either good or bad years; of course, the heavy duty on manufactured goods accounts in a large degree for this. The wage of a Russian is not very high, but as a rule they are as high as he deserves. The scale is about as follows:

A minder, $6.81 a week.
A ring spinner, $3.89 a week.
A drawing tender, $3.65 a week.
A card tender, $2.19 a week.
A weaver, two looms $3.65 a week.
A laborer $2.77 a week.

There are no labor unions, as the government does not allow unions; besides, there are not the men here to control unions; yet, at the same time, there are a lot of strikes and labor troubles, but they lack organization. They are, however, very difficult to deal with; the more so, since the Russian law is so difficult to understand, and one never hardly knows how he stands with the law.

When a strike occurs, for the three following days, the management must start the engine, both at morning and afternoons, for a quarter of an hour. Then they are allowed to pay them off if they don't turn in for work during these three days. When the mill is running, one cannot discharge a hand, without giving a fortnight's notice or a fortnight's pay. This is very inconvenient, the more so, when if it is on the operative's side, they can get out of this rule. In fact, all along the manufacturer is very harshly dealt with.

Of course, the operatives can be fined up to one-third of their wage, and this does give you some slight satisfaction, yet it is not a practice to be recommended. Mills are also troubled with operatives' dishonesty and to cope with this, they have to have searchers to search them on leaving at dinner time and evening, and it is surprising what is discovered round and about them. For this, you can dismiss them, but it is not advantageous enough to summon them, as this course is very unsatisfactory. There is a millowners' association in Petersburg, but the government stands in the way of good mill legislation. Generally speaking, the cotton trade is handicapped by unreasonable laws, uneducated operatives, bad living conditions, drunken habits, lazy workmen, and business corruption.

The central committee for small holdings in Russia has appropriated $10,000 to be used by one of the associations in Transcaucasia for organizing an experimental cotton plantation. This is done in order that the owners of minor local mills may be able to compete with American factories.

"The withholding of courtesy may apparently be ignored, but it is recognized, and reacts to the detriment of those who are deficient in this respect. Self-interest, therefore, demands that courtesy be practiced."

MOISTURE TESTS ON AMERICAN COTTON*

Results Obtained at the Cotton Testing and Conditioning House at Havre, France.

BY D. E. DOUTY, MANAGER U. S. CONDITIONING AND TESTING CO., NEW YORK.

In a paper presented before the American Cotton Manufacturers Association (to be found in the May, 1913, issue of Cotton), I called attention to the variation of the humidity of the atmosphere during the principal months of the ginning season, July to January and the possible moisture content of raw cotton under those conditions.

The curves submitted were for the atmospheric humidity as reported by the U. S. weather bureau at Glaveston, Texas, New Orleans, La., Charleston, S. C., and Mobile, Ala., and represent with a reasonable degree of accuracy the moisture condition at the principal points of shipment of cotton from these states. The data also represents quite well the condition throughout the respective states with the exception of inland and upland portions of Texas and South Carolina.

cent of the total number and may be selected by a representative of the conditioning house or half each by the buyer and seller. A sample consists of from 700 to 800 grams (1.5 to 1.8 lbs) divided into two test samples. The charges for the tests are based upon the cost of the work and are moderate. The fee is 35 francs ($6.755) per 100 bales or 22.50 francs ($4.342) per 50 bales or less.

The French standard regain is 8½ per cent and the report of the testing house is based upon this standard.

Where cotton shows a less amount of moisture than this standard it is reported as gaining moisture in the test. Where it shows a greater amount than the standard it is reported as losing. Each test lot usually represents samples from 50 or 100 bales and in a few cases a larger number.

TABLE 1.

TEXAS

Month	No of tests	No of bales	Gain in weight at 8½% regain			Loss in weight at 8½% regain		
			Least %	Greatest %	Mean %	Least %	Greatest %	Mean %
From Sept 20	9	895	0.321	2.065	1.055			
Oct.	26 3	2105 200	0.175	1.869	1.197	0.171	0.589	0.337
Nov.	34 8	3193 550	0.018	1.666	0.776	0.075	3.167	1.011
Dec.	28 10	2404 750	0.027	1.351	0.507	0.074	1.727	0.614
To Jan 9	7 6	450 350	0.037	0.690	0.455	0.266	3.056	0.847
Sept 20 to Jan 9	104 27				0.811			0.753

CAROLINA

From Nov 28	1	50						3.368
Dec.	3	300				2.423	4.055	3.350
Nov 28 to Dec 10	4	350						3.354

ALABAMA

From Oct 29	1 1	96 100			1.057			3.250
Nov	6	300				0.535	3.946	2.928
Dec.	7	625				1.005	2.875	2.080
To Jan 7	1	100						3.146
Oct 29 to Jan 7	1 15	96 1,125			1.057			2.561

GEORGIA

Month	No of tests	No of bales	Gain in weight at 8½% regain			Loss in weight at 8½% regain		
			Least %	Greatest %	Mean %	Least %	Greatest %	Mean %
From Oct 28	1	50						5.018
Nov	6	448				1.812	4.908	2.748
Dec.	9	796				1.786	4.694	2.963
Jan.	6	450				0.889	2.588	1.558
Oct 28 to Jan 6	22	1774						2.615

NEW ORLEANS

From Oct 30	1	100						1.319
Nov	8	950				1.210	3.352	2.147
Dec.	3 17	250 1325	0.091	0.677	0.562	0.739	4.087	2.073
Jan.	6	400				0.366	3.819	2.324
Oct 30 to Jan 9	3 32	350 2675			0.562			2.112

AMERICAN FROM HAVRE STORAGE

From Oct 10	4 5	255 423	0.550	1.591	1.096	1.377	3.032	2.382
Nov	1 2	50 150			0.689	0.364	2.717	1.545
Dec.	1 6	50 448			0.447	0.702	2.710	1.837
Jan.	3	250				0.330	2.119	1.229
Oct 10 to Jan 7	6 16	400 1272			0.753			1.800

The first accurate information to be published upon the moisture content of a considerable quantity of raw cotton has recently been issued by the new cotton testing house at Havre, France. The report covers the operations of the House from September 20th, 1912, to January 9th, 1913, and includes cotton direct from steamers and from storage.

The Havre cotton testing house was established in 1912 by the French spinners association for the purpose of determining the moisture content of raw cotton and making such other tests as might be desired. All cotton received at the port of Havre must be sampled and tested by this laboratory before it will be accepted by any of the members of the French spinners association.

The cotton is sampled at the piers or warehouses and the samples are transported to the conditioning house in air tight metal containers. The bales sampled are 10 per

Table 1 gives a summary by months of the tests made upon cotton from different localities. In columns two and three the number of tests and the number of bales involved are arranged so as to show independently those that had less than the standard amount of moisture ("gain in weight"). Of course it is impossible to draw from these values any but the most general comparisons and conclusions. It is fair to suppose that the Texas cotton tested in late September and October was early upland, interior cotton ginned in Texas in July and August when the weather was hot and dry. The results show generally that the cotton was uniformily dry and gained upon being tested. The possible values for Galveston, on the seashore, computed from the weather reports and shown in Fig. 2 of the paper referred to above were quite uniform during August and September at an average of 10 per cent. For the later

*Read before the National Association of Cotton Manufacturers.

months they fluctuated from 8 to 15 per cent, being in general above 10 per cent. The Havre results show an increasing amount of moisture for the later shipments of Texas cotton and an increasing number of lots show a loss on being tested.

The greatest gain, in September, 2.065 per cent steadily decreases it reaches 0.690 per cent in January; the mean value decreasing from 1.055 per cent to 0.455 per cent.

There were no lots which showed a loss in September. From October the greatest loss, increases from 0.589 per cent to 3.056 per cent and the mean loss from 0.337 to 0.847 per cent. The mean total gain, 0.811, per cent is slightly greater than the mean total loss, 0.753 per cent, showing that for Texas cotton in Havre the standard regain of 8½ per cent is about the proper value.

Of the New Orleans cotton only 3 lots, aggregating 250 bales showed a gain, the average being 0.562 per cent, while the mean loss increased from 1.319 per cent in September to 2.342 per cent in January and the mean total loss was 2.112 per cent, corresponding to 10.6 per cent regain from absolutely dry cotton. The least loss for the period was 4.087 per cent.

TABLE 2.

DISTRICT	TOTAL NO. OF BALES	NO. OF BALES	APPROX. QUANTITY LBS.	AVERAGE GAIN %	AVERAGE LOSS %
TEXAS	10,897	10,047	5,023,500	0.811	
		1,850	925,000		0.753
NEW ORLEANS	3,025	350	175,000	0.562	
		2,675	1,337,500		2.112
ALABAMA	1,221	96	48,000	1.057	
		1,125	562,500		2.561
GEORGIA	1,774				
		1,774	887,000		2.615
CAROLINA	350				
		350	175,000		3.354
FROM STORAGE	1,672	400	200,000	0.753	
		1,272	636,000		1.800

One lot of Alabama cotton, 96 bales, showed a gain of 1.057 per cent, while the mean loss varied from 2.08 to 3.25 per cent. The least loss was 0.535, while the greatest loss was nearly 4 per cent.

No Georgia cotton showed a gain. The losses varied from the least at 0.889 per cent to the greatest of at 5.018 per cent, with a mean total loss of 2.615 per cent.

Carolina cotton all showed losses ranging from the least at 2.423 per cent to the greatest at 4.055 per cent with a mean total of 3.35 per cent. Of twenty-two lots consisting of 1672 bales of American cotton from storage in Havre, upon which locality is not indicated, all but six lots, 355 bales showed loss. Those showing gain ranged from 0.550 per cent to 1.591 per cent with a mean total gain of 0.753. The losses ranged from 0.33 to 3.032 per cent with a mean total loss of 1.8 per cent.

Comparison shows that the values obtained by the Havre conditioning house confirm in a very interesting manner the possible values suggested in my paper on the value of Accurate Testing in the Cotton Industry. The values are in general a little lower, but their fluctuations with season and from lot to lot confirm the predicted condition.

The summary in Table 2 gives the average gain and loss by localities, the number of bales, separated by gain, and loss and the approximate quantity computed on the assumption of 500 pounds per bale. This shows that of the ten million pounds of American cotton tested 5.5 million pounds contained less than the French standard 8½ per cent moisture and 4.5 million pounds contained more than the standard amount.

Table 3 shows the money value of this work. The gain and loss of moisture in pounds was calculated for each individual lot and the value of the gain and loss to the French spinner was computed on the assumption of 17 cents per pound (85 francs per hundred pounds), as the average price of cotton in the Havre market during the last half of the year 1912.

The results as a whole illustrate admirably the fact for which I have long contended that the conditioning, *i. e.*, the accurate determination of the dry weight of textile materials plus a standard moisture "regain," is not an operation having for its only purpose the prevention of fraudulent dealings and protection of the buyer against sharp practice of the seller.

It is just as important to the development of honest and intelligent business methods, the only methods which lead to continued and permanent success, that the seller whether he be a planter, broker or banker should receive an allowance in settlement for accounts upon which he has furnished material below the average in moisture content, as it is that the buyer should receive an allowance for excessive moisture.

TABLE 3.

DISTRICT	WEIGHT OF COTTON	MOISTURE		VALUE OF MOISTURE AT 17 CTS. PER LB	
		GAIN LBS.	LOSS LBS.	GAIN	LOSS
TEXAS	5,023,500	35,662		$6,062.00	
	925,000		6,137		$1,043.00
NEW ORLEANS	175,000	937		159.00	
	1,337,500		28,020		476.00
ALABAMA	48,000	507		86.00	
	562,500		14,006		238.00
GEORGIA					
	887,000		21,573		3,667.00
CAROLINA					
	175,000		586		99.00
FROM STORAGE	200,000	1,984		337.00	
	636,000		12,366		2,102.00
TOTAL	9,969,500	39,090	82,688	$6,644.00	$9,768.00
VALUE OF EXCESS MOISTURE (LOSS-GAIN)					$3,124.00
COST OF TESTS BASED UPON SCHEDULE OF FEES					1,388.00
NET CASH GAIN TO FRENCH SPINNERS					1,736.00

Industrial justice would award to the Texas grower or broker, the additional amount which he should have for his extra dry material just as it would exact from the seller of Georgia, Alabama or Carolina cotton, a deduction for the excessive water contained in his material. The French spinners who purchased the dry Texas on conditioned weight suffered no loss by the allowance made necessary in the settlement. One hundred pounds, conditioned weight, of Georgia, Alabama or Carolina cotton will produce exactly the same amount of yarn as one hundred conditioned weight of Texas cotton of the same quality, *i. e.*, there is the same amount of dry fiber in both.

Knowing that each pound of cotton he purchased, conditioned weight, would produce a definite amount of yarn no matter how much moisture it had previously contained, the spinner possesses a uniform standard upon which to judge the price offered and the cost of his product.

Materials which are bought and sold on conditioned weight have the uncertainty of moisture content completely eliminated and are entirely independent of the conditions under which they have been packed, transported or stored. The showing made by the Havre conditioning house during the first three months would seem to completely justify its establishment.

Mill Conditions and Market Reviews.

SOUTHERN MILL SITUATION.

(Special Correspondence.)

In cotton manufacturing we see an industry only waiting upon the final enactment of the new tariff to prosper, unless all signs are misleading and all observers wrong, as seldom before. The beginning of the end has at last been recorded in the passage of the Democratic tariff bill. The country will shortly be settled down to a business basis under the new, and what we confidently hope will be, better conditions. Stocks of goods in all hands are extremely low, and throughout the cotton textile world consumption has overtaken production,—has more than overtaken it almost everywhere. The cotton manufacturers of all countries are doing a full business at good prices; they have their books full of orders, and no one is looking for a chance to cut anybody's throat. It is a great pity, in these circumstances, that the tariff bill should have been loaded up in the Senate with a rider aimed at the future-trading feature of the cotton exchanges and having no proper relation to the purposes of the bill. Many think it of quite enough importance to have received independent consideration on its own merits instead of being ridden through as part of a measure for whose early enactment there has been the utmost demand. We note in a recent issue of the Wall Street Journal that a trained observer of cotton textile conditions says: "Congress has already cost the Southern manufacturer probably $10,000,000 on account of the scare which anti-future legislation threw over the market during the past three or four months. The price of cotton has advanced about $10.00 a bale since the postponement of the proposed future tax. Ordinarily the Southern mill buyer waits until the new season begins to do his buying. Four months' supply for the South equals 1,000,000 bales, and at an increase of $10.00 a bale the Southern mills would pay $10,000,000 more for cotton after September 1st than they could have gotten it for before that late by resort to hedging against mill commitments to deliver yarns or cloth." Neither the North nor the foreign world buys in this way, so that the burden has been thrown mainly on the South.

Apropos of the cotton tax, it is remarked that we seldom see a body of business men menaced with radical legislation who have taken a more philosophical attitude than the members of the New York Cotton Exchange do now. President Edward K. Cone states that the exchange has filed no protest as a body, and probably will not do so. Its members are leaving the contest to Southern interests, which, they believe, would be very much more injured than themselves by the proposed cotton tax rider in the tariff bill. We hear universal protest from the Southern cotton trade, some protests from manufacturers and not a few from growers, but the proposed chief victim seems to be worrying least of all. It is also remarked that at an early date cotton future trading will be resumed at Bremen, Germany, after a vain attempt to conduct the Bremen Exchange without this feature,—although the need of future trading is much less there than in the country where the cotton is not only spun but grown. Liverpool and Bremen, say these philosophers as quoted in the New York financial and business journals, would get practically all the business now done by New York and New Orleans. There is some talk among them, however, of a transfer of their future-trading department to Montreal in the event that the purposely prohibitory tax now pending becomes law.

Frederick B. Gordon, President of the Georgia Cotton Manufacturers Association, believing that this handicap would effectually prevent legitimate hedges necessary to the cotton manufacturing business, has telegraphed urgent protests to Senator Simmons as Chairman of the Finance Committee and to Senator Hoke Smith. "Hedges which mills buy for future delivery of cotton to cover sales of cloth made for future delivery," argues Mr. Gordon, "are the very antithesis of gambling. They protect the mill when actual cotton cannot be obtained to cover the purchase of cloth by a buyer who wants deliveries made months ahead. This purchase of cotton futures is sold when actual cotton is bought, and this transaction is the backbone of the cotton mill business." Mr. Gordon believes that if legislation must be had to stop mere gambling in cotton or other products there should be an exemption to protect those who use the cotton exchanges to keep from gambling. Some manufacturers on the other hand believe that the importance of future contracts to the manufacturer is somewhat exaggerated, as few manufacturers are actually so dependent upon the cotton exchanges. But, the manufacturer would lose a really valuable resource, whether he had been employing that resource directly or had been getting the benefit of it through dealers who did. As for the dealers, they would occupy a far more speculative position with the privilege of hedging their sales nearly destroyed.

In this regard, attention is called by the New York Evening Post to the fate in 1892 of a proposed tax on cotton futures amid circumstances which bear very obviously upon the proposal pending now. The defeat of this earlier measure was largely due to a powerful speech against it by Senator Edward D. White, of Louisiana, now Chief Justice of the United States. Mr. White contended that such a tax would be not only wrong in economic principle and irreconcilable with fairness, but utterly repugnant to the Constitution of the United States. He affirmed that under the pretence of using the taxing power to raise revenue "we have breathed into this law a living lie," and "declared that our purpose is to tax for revenue, when every line and letter of the bill says that it is not an exercise of the taxing power at all, but an attempt to destroy." The tax was thought discriminatory because it singled out certain products,—it is argued that the case would be much stronger now, for then futures in wheat, corn and pork were included, whereas it is now proposed to tax cotton futures alone. The unit of a future transaction in cotton is 100 bales, and at one-tenth of a cent a pound a tax of $50.00 plus brokerage of $15.00 would have to come out of somebody's pocket on every hundred bales bought or sold.

Protests against this rash proposal are becoming so strong that Congress may yet repent. There is little hope that the amendment will be voted out altogether, but the cotton interests of the South feel that it will be doctored in a wholesome manner, and that "its teeth will be pulled" to the extent of safeguarding the interest of the Southern planter and manufacturer.

In talking with Mr. B. D. Heath, President of the Manetta Mills, at Lando, S. C., and the Newton Cotton Mills, at Newton, N. C., he stated that he felt optimistic as to the business outlook generally, and while he is not a "free trader," in his opinion the reduction in our tariff is not going to work injury to the manufacturers of this country, but on the contrary will have a wholesome effect on the country, as the tariff heretofore has been higher than necessary.

"The reduction in our tariff should be gradual," said he, "to avoid its working injury and depreciation to American property generally; it really should take from fifteen to twenty years to bring it down to where it properly should be. Everything in this country has been built up on a high tariff basis, hence the manufacturers as well as other industries have gone along on an extravagant basis, and should the props all be knocked out at one strike, the result would be little less than a calamity, and would mean a depreciation of property of all kinds.

"In reference to the bill proposed by Congress by which they impose a tax on cotton futures, this is neither practical nor in order, and I think will work great injury to the farmer who produces the cotton, and to the manufacturer who spins it. We want legislation that will require the cotton exchanges to give us a more practical, stable contract, and require the seller to deliver what he sells. For instance, the present contract is based on middling cotton, but when the buyer has occasion to call the cotton on the present existing contract, the seller has the prerogative of tendering him any grade from the lowest to the highest that is deliverable on contract, which is entirely wrong and impracticable. The kind of contract that would correct the whole situation would be simply to require the seller to deliver the average grade of what he sells, which would be average middling cotton. In such an event, if the buyer wanted 100 bales of strict middling cotton he could buy 200 or 300 bales of contracts from which he could select his 100 bales of strict middling, ship it to his mill, and then if he desired to do so he could sell two future contracts and deliver the remainder that would be unfit for his use on the two contracts sold."

The cotton world as a whole has been thrown into a state of intense excitement owing to poor reports of prospects for the American crop, and values continue to rise, notwithstanding current prices being at a very high level for this period of the year, when the crop has just started to move to the ports, which will be reflected in increasing receipts and increasing stocks. Based on the low reports of the Department, traders are anticipating a yield this year of less than 14,000,000 bales, and as last year's consumption of American cotton was 14,903,000, there is an increasing demand for contracts for both futures and spots.

As a result of the sudden rise in cotton, yarn and cloth values met the advance, and a great many orders were placed for future delivery, so that those mills whose selling agents were active and who have made the best of their opportunities will undoubtedly have smooth sailing for the next several months.

The feature of the summer months has been the tendency to increase existing plants rather than build new ones, which is considered a very healthy sign. It is difficult to determine the amount of new machinery that has been purchased to replace old equipments, but it is known to have been an amount greater than usual, and many antiquated plants have been brought to a high state of efficiency.

South Carolina mills have made a very favorable showing this year. Commissioner Watson states that upon a study of the tables and very close observation of the state factory reports, those who are interested in the welfare of the cotton mills of the state will be much gratified with the excellent showing made this year as compared with that of last year. There has been an increase of $7,250,137 in capital stock invested, and an increase of $5,239,513 in value of annual products. The report shows that the mills have added 153,516 spindles and 4,813 looms to their productive power during the year. This seems to have been a very favorable year for the textile industry of the state.

One of the most important btts of industrial news in some time has recently been announced, to the effect that the big Ashley and Bailey string of silk mills, reaching from Paterson, N. J., to Fayetteville, N. C., will be sold at auction on various dates in October. The nine Ashley & Bailey mills are located in six manufacturing towns, Paterson, N. J., York, Pa., Columbia, Pa., Coatesville, Pa., and Fayetteville, N. C.

The three main mills,—the original Ashley & Bailey factories,—and the Hawthorne mill at Paterson will be put on October 14th. The mill at York will be sold on the 16th; the sale at Columbia, where there are four big factories built in a rectangle and considered one establishment, and at Marietta will be on the next day, and the Coatesville sale the day following. The two mills at Fayetteville will go on the block October 21st.

These factories, perhaps the most valuable string of silk manufacturing establishments in the United States, are not being put up for sale because they are not paying properties, it is claimed, but because the descendents of the owners, Ashley & Bailey, have no idea of even eventually participating in the active management of the properties, and the present owners have therefore determined to sell the mills now, rather than have them pass into strange hands after their death.

On September 18th a large and enthusiastic meeting of the Southern Hard-Yarn Spinners Association was held in Charlotte. The association assembled in answer to a call issued by President W. B. Moore, of Yorkville, S. C., to discuss some phases dealing with the selling end of the business. The regular annual meeting will be held in February, at a place to be chosen later. At present about 1,000,000 spindles are represented in this association, and a number of new members were added at this meeting. Several of the members stated that the prospects for the Fall were exceptionally bright, and believed that the hard-yarn spinners would have a profitable year. Discussion as to where the price of cotton would stop, was generally admitted by those present to be a question too deep for anything but wild guessing. None of the members of the association, when seen after the meeting, were willing to hazard any statement as to whether it would reach 15 cents this fall or not. The hot wave through the West was given as the main reason why cotton was taking a little sweep upward at the present time. A general discussion of the business outlook for the coming year was held, and it was the sense of the majority present that this Fall would be a good one from the standpoint of hard-yarn spinners and other manufacturers, especially in the South.

The following additions and improvements are noted:

The Revolution Manufacturing Co., at Greensboro, N. C.,

has made announcement of a provision made by them for the extension of its plant which will call for the expenditure of between $1,000,000 and $1,500,000. This is considered a marked evidence of the healthy condition of the textile trade at present.

The Dallas Cotton Mills, Dallas, Texas, have placed an order for a number of new roving and spinning frames. This mill operates 12,000 spindles on flat duck and drills.

A company has been organized in Charlotte, N. C., composed of Chas. B. Skipper, Jno. C. Rankin, S. M. Robinson and associates for the purpose of building a coarse yarn mill, this mill to be located a few miles out of Charlotte, and to contain about 5,000 spindles.

Much interest is aroused by the election of B. E. Geer, of Greenville, S. C., to the office of President of the Westervelt Mills, of that city, at a meeting of the directors held recently in Pawtucket, R. I. The Westervelt Mill was erected in 1911 and began operations last year. Long staple cotton is used in the manufacture of high grade goods. The Westervelt operates 53,000 spindles and about 1,200 looms and represents an investment said to approximate $1,300,000.

The Ethel Cotton Mills, Selma, N. C., have decided upon an addition of about 3,000 spindles, with complementary machinery. At present they operate 5,280 spindles, their product being 10's to 18's hosiery yarns.

The Hamilton Carharrt Mfg. Co., with principal mill at Rock Hill, S. C., has been incorporated for $100,000 to manufacture denims. Hamilton Carharrt is President.

At Gibsonville, N. C., a new knitting concern has been organized under the name of the Gibsonville Hosiery Mills, with authorized capital stock of $100,000, of which $11,000 has been paid in, and the plant will be built at Gibsonville. The incorporators are G. W. Fogleman, president of the Burlington Hosiery Mill Co., of Burlington; J. L. Kernodle, W. C. Michael and others. The plant of the Burlington Hosiery Mill Co., was burned in April, and nothing has been done toward repairing the property at this time. It is thought probable that the new concern will take over the business.

The Southern Aseptic Laboratories, of Columbia, S. C., whose plant was recently burned, are planning to re-equip their mill at once, contracts for new machinery having been placed.

The Riverside and Dan River Cotton Mills, at Danville, Va., are making rapid progress on the construction of their big additions. It is thought that the entire installations will be in position and ready for operation before the end of the current year. The plant will then be the largest cotton manufacturing establishment in the South. This enlargement consists mainly of an additional mill which when completed will be equipped with 75,000 spindles and 2,200 looms, with accompanying machinery, their product being cotton cloth. At present the company has 240,000 spindles and 7,700 looms, the annual capacity being 90,000,000 yards of cloth, requiring the consumption of 50,000 bales of cotton. The company is capitalized at $7,000,000, and is investing about $1,500,000 for the addition referred to.

The Durham Hosiery Mills, at Durham, N. C., contemplate the addition of a waste equipment. This mill now operates 25,000 spindles.

The Chadwick-Hoskins Co., are increasing the capacity of the picker room at their Pineville plant.

The Jackson Fibre Company, at Bemis, Tenn., have placed order for a large number of additional cards for their plant.

An order for new spinning frames has been placed by the Ledbetter Mfg. Co., of Rockingham, N. C. This mill is now equipped with 4,000 spindles, and their product is 12's to 14's, ply skeins and tubes.

The plant of the Roberta Mfg. Co., at Concord, N. C., which was burned about two years ago, will be rebuilt by P. M. Keller, Jno. C. Rankin and S. M. Robinson. An order has been placed for machinery to re-equip the plant.

The Anna Cotton Mills and the Kings Mountain Mfg. Co., of Kings Mountain, N. C., are adding card room machinery.

The Virginia Cotton Mills, at Swepsonville, N. C., have recently placed an order for from 3,500 to 4,000 spindles, with complimentary machinery. This mill is making extensive improvements, planning to change shortly from water power drive to electricity almost exclusively, using individual motor drives on their spinning and group drives for the balance of their equipment.

Current was turned on the new annex at the Dixie Cotton Mill, LaGrange, Ga., on Sept. 29, which practically doubles the capacity of the mill. Simultaneously with the turning on of the current in the annex the mill officials announce that every piece of machinery in the old mill will be replaced within the next ninety days with the newest and most modern appliances.

The Covington Mills, at Covington, Ga., are getting ready to receive the new machinery recently bought by them, consisting of roving, spinning and spoolers. They now operate over 25,000 spindles on fine sheetings.

The Saxon Mills, at Spartanburg, have placed order for a large amount of additional machinery.

The Cox Mill, of Anderson, S. C., was sold at public auction on September 16th to Wellington, Sears & Co., of Boston, for $125,000, the upset price fixed by the court. This is the third time this property has been offered at public sale this year, the upset price being reduced each time. The cost of this mill was nearly $500,000, and most of it is not over ten or twelve years old. The mill contains 25,000 spindles, equipped to weave sateens. This plant has been closed down for nearly a year, but it is understood that the new purchasers will begin operations as soon as possible.

The Aurora Mills, at Burlington, are adding a small lot of machinery.

Tallapoosa Mills, Tallapoosa, Ga., have placed order for five spinning frames and a number of twisters.

Orders are being placed for machinery to equip the Corriher Mills, at Landis, N. C. This mill was built several years ago, but no machinery was bought for it. They will install about 4,000 spindles for making 24's hosiery yarns.

George R. Boyd, formerly vice-president and chief engineer of the Brett Engineering & Contracting Company, of Wilson, N. C., announces that he has opened an office in the Savannah Bank & Trust Company building, Savannah, Ga., for the practice of drainage engineering. Mr. Boyd will also do construction work along the same lines.

The striking thing is not how different business methods are abroad, but how similar to the best American standards.

NEW ENGLAND MILL SITUATION.

(Special Correspondence.)

One of the most radical changes known in the cotton goods trade has taken place during the past month. Stocks of goods had been working to very low points for many months as a consequence of the tariff agitation. For some months there had been a feeling all through the trade that the cotton crop was to be large and prices would be low. The prolonged drought in the cotton growing sections in August had begun to have some effect on the prices of goods in the early weeks in August. But it was not until the government bureau report on cotton was issued showing a drop in condition in a single month of nearly 11 points, that the cotton goods trade of the country began to appreciate what was ahead of it if cotton was to cost above a level of 12 cents a pound for the new cotton year.

Conditions for a large demand for goods were right when the bureau report was issued and before it, but the report seemed to give the needed stimulation to the demand. From the day the cotton report was issued until the present moment the course of the markets has been a rising one, and the acceleration of the demand by a return of sanity in considering the scarcity of supply, has brought on a situation that is almost unprecedented. Unfortunately for the cotton manufacturers they have no large supplies of cheap cotton. Even if they had been gifted with the foresight to predict high prices upon the effects of a drought in August, they would not have been able to find the cotton that would meet their year's requirements.

Consequently the condition exists of most of the mills of the country being forced to pay a high level for raw material after having sold some part of their product on contract at prices that cannot net a profit if cotton is to hold at its present level. Both Southern and Eastern mills are alike in the matter of a light supply of cheap cotton.

The prolonged tariff discussion is rapidly drawing to an end and cotton manufacturers are reconciled to a struggle to adjust themselves to the new conditions a new law will impose. Many of them are hopeful but few are convinced of the wisdom of the legislation that Congress has seen fit to approve. As the new adjustment begins general business conditions within the trade seem promising for a few months at least. Money is high, but stocks are low. The worst of the bitter labor struggles appears to have passed as the much dreaded I. W. W., is now known and properly measured by operatives as well as by the general public. There is a real need for goods and the scarcity of staples for immediate delivery is hastening the adjustment of values to cotton. The purchasing power of the general mass of the people has not been impaired as yet and if the general operation of a new tariff law does not injure it greatly, it seems probable that the mills are in for a period of steady running all through the winter.

The advance in cloth prices has been genuine and broad. Wide print cloths have advanced ¾ cent a yard, and narrow goods have gone up ½ cent a yard. Brown sheetings have gone up in the same ratio. Bleached sheetings were advanced three times and are now on a basis of 8¾ cents for 4-4 fruit of the loom with an "at value" rule prevailing. Duck has been shortened in discount about 7½ per cent. Denims are up a full ½ cent a yard. Linings have been advanced from ¼ cent to ½ cent and even fine combed yarn plain cottons have participated to some extent in the rise. The advance has been controlled, and even checked, by the desire of merchants to avoid reaching a level that cannot be maintained when a new period of late buying is entered upon by the jobbing trade. It has also been checked in several directions by an inability to deliver spot goods in answer to the new values placed upon them. Many lines have been temporarily withdrawn, while others are held at value until the course of the cotton market can be gauged and the tariff bill is finally signed.

While the rise has been very rapid it has not been due so much to cotton conditions as to a realization by the jobbing and manufacturing trades of the country that stock scarcity is not a bugaboo. An actual scarcity exists for quick merchandizing. Many jobbers have sold goods they have not fully bought. Many converters have gone shy of gray goods on the theory that such a rapid rise could not be maintained either in cotton or cloth. There is still a large quantity of cloth to be bought and much of it cannot be supplied from foreign sources, however favorable the tariff laws may be. In other words, the staples that are needed and will have to be bought will not be imported, and the cloths that do come in will not take the place of the domestics Americans have been accustomed to use.

Many of the New England mills have been timid ever since the rise began and they have not sold freely on contract. They have not been able to secure cotton even when high prices on the exchange failed to represent the high prices asked for the actual cotton in mill centres. Fall River is a sample of the situation. The mills there are about one-half sold ahead for October, and about four-tenths sold for November. The stock that is carried there is less than 850,000 pieces and it includes all kinds of odd goods. From week to week as prices have gone up the product or a little in excess of it has been disposed of at ruling quotations.

Rhode Island mills have sold a little more freely and they are in many instances bare of stock and sold ahead on many of the best known staples about ten weeks. Some mills sold goods low and are making unsatisfactory headway in turning out all the goods that are wanted. The bleacheries and finishing works are being pushed hard for spot goods but have not accumulated the forward orders they would ordinarily have booked at bid prices, if cotton could be had or if prices could be named that would satisfy buyers and induce profitable late contracts. There is still a period of readjustment of cotton and cloth values to be met.

There are many New England mills that have large contracts on spring goods, such as dress ginghams, chambrays, shirtings, and so on. These goods were sold at prices predicated upon low priced cotton. On the other hand there are many mills whose forward orders do not include as late deliveries as are usually booked at this time of the year. The New Bedford and other fine fancy goods mills were not getting the business on their lines and they are not contracted ahead on staple fine goods or semi-fancies much beyond the turn of the year. If there is to be improvement after the tariff bill is passed they should participate in it to a larger extent than some of the coarser mills.

Staple prints were advanced to 5¼ cents early in the month after a drop to 5 cents late in August. A large business has been booked on staple prints, in fact larger than in two years or more. Percales have sold remarkably well,

the Pacific works alone having disposed of half a million pieces for spring. There has also been a steady gain in the demand for fancy prints of a novelty character. Batistes and lawns have given way to printed crepes, plisse, printed ratines, and printed voiles. One large printer is doing an excellent business on printed plaids. The bleached goods trade has been excellent. The bleachers have not been so busy in many years on staple goods for quick shipment. Staple ginghams are under order for at least 90 days ahead, while all the products of fancy yarn dyed goods and staples, of the Parkhill and Lancaster mills have been sold up and withdrawn for spring.

For the next three months all mills have secured as much business as they care to take, yet many of them are working on orders that will not begin to show them a profit based upon the replacement cost of the goods as costs stand at the present moment. Should cotton go to a 15 cent basis, as many cotton factors are predicting, it is not believed in New England that prices for goods can be raised to that plane, so that a curtailment of output may be enforced.

There is a pronounced scarcity of labor in the manufacturing districts. In many centres mills are unable to operate more than 90 per cent of their equipment without regard to wages or other general labor conditions. A prospect of steady work during the winter may bring in more operatives, manufacturers hope, yet it is doubtful if the surplus will make up for the extra demands that are being made by selling agents.

It is a singular commentary on the state of mind of manufacturers as a whole, that while prices for goods have been rising fast they have not gained confidence in their ability to meet the rise in cotton that seems assured. To some extent this is due to the attitude of selling agents who do not want to see anything like a speculative condition in merchandizing when there is so much uncertainty ahead for next year in adjusting trade conditions to the volume of importations that is looked for. There is little or no question of the permanency of most of the values that have been reached, for the next two months at least, as merchants and manufacturers agree that they have been due in a great degree to the short supply of goods at the time that a normal demand asserted itself.

Some things have happened which would be regarded as exceptionally encouraging under most conditions in past years. The United States Finishing Company's financial troubles have been adjusted and no reorganization will be necessary. Machine shops are busier than they have been in a year or more. Bleacheries, dyeing establishments, printers, and many others in the textile trades are working a larger part of their machinery more regularly. More goods are wanted than are being shipped, yet there is as much hesitation about the long future of cotton goods trading as there was before a round ten per cent advance in cloths had taken place. There are many reasons for saying that New England trade is good in the cotton mills, yet half the manufacturers will not agree to the statement.

It has been suggested that some new material be found for the covering of cotton bales; perhaps asbestos cloth, or by chemically treating the jute covering to make it fireproof, whereby the cotton will be protected against fire. Here is a splendid chance for the inventor of a low-priced fire-proofing method to make good.

COTTON CROP CONDITIONS AND A REVIEW OF THE MARKETS.

(*Contributed Exclusively to* Cotton.)

BY H. AND B. BEER, NEW ORLEANS.

The fundamental features of the market being the outlook for only a moderate size crop and possibly a large consumption, the undertone of the market remains firm at current high levels, owing to crop condition reports showing further deterioration and exports and spinners takings of American cotton to date running ahead of last year. Exports from all ports at the time of writing were 215,000 bales; against 160,000 to even date last year, since September 1st, 434,000 bales compared with 288,000 one year ago. Spinners takings by the world of American cotton the week ended September 19th were 205,000 bales vs. 129,000 for the corresponding week of last season, and the total takings of American cotton by the spinners of the world since September 1st are 522,000 bales compared with 410,000 to even date last year.

It will be seen, therefore, that the demand is more urgent than generally supposed, notwithstanding prices to be nearly two cents higher than they were at this time last season. Some people contend, however, that September exports and takings represent old business put through when values were much lower than they are now, and that after this month, exports and takings will not compare so favorably with developments on these lines after this time one year ago. This remains to be seen.

The movement to market the past week was of record breaking proportions notwithstanding the reported short crop in the Southwest and almost impassable roads in the central and western portions of the cotton region, but this is explained by the crop being earlier and larger than last year east of the Mississippi river where arrivals are running much heavier than at this time last season.

The quantity of cotton marketed the past week was, we estimated yesterday, 401,000 bales, against 334,000 last year and 384,000 year before last, making the total since September 1st figure 856,000 bales compared with 710,000 last year and 796,000 year before last. The world's visible supply of American cotton has increased 198,000 bales the past week against an increase of 206,000 for the corresponding week of last year, other kinds decreased 33,000 against 28,000 the total of all kinds having increased 163,000 against 178,000 one year ago.

Commenting upon the drouth then existing in the Southwest, and the unfavorable effect it was having on the cotton plant, we stated in our review of one month ago that the market showed a disposition to work higher again, owing to the fear of further damage to the crop in the Southwest should the weather west of the Mississippi river remain dry and hot for any considerable period.

Subsequent developments show that the drouth continued with all its severity throughout the month of August, in Texas, Oklahoma and western Arkansas. As a result the market did work higher, so much so that prices are about two cents per pound, or $10 per bale higher than they were one month ago, and while it is probable that reactions will occur from time to time, indications are that values are to seek higher prices still eventually.

All hope for a bumper crop has been discarded, there is a poor chance for a large crop and the best to be expected

is a moderate size yield, whereas the world will probably need 15,000,000 bales of American cotton, or much more cotton, probably by at least 500,000 bales, than present crop conditions promise.

According to Secretary Hester the consumption of American cotton by the world was as follows:

Season—	1912-13	1911-12
United States, North	2,617,000	2,481,000
United States, South	2,970,000	2,744,000
Foreign	9,316,000	9,290,000
World's total	14,903,000	14,515,000

Last year's crop graded middling to strict middling, compared with an average for year before last of strict low middling to middling. For middling the average price per pound was 12.20 cents against 10.16 year before last and 14.60 three years ago.

This season the average grade of the crop promises to be lower than last season and may average lower than season before last. This is probable, owing to the recent drouth having caused premature opening of the crop west of the Mississippi river, which was injured in grade by incessant, heavy rains following in the wake of the drouth in Texas, Oklahoma, Arkansas and Louisiana, where there was more cotton open than ever before at this time of the year.

Under the circumstances there has been an urgent demand for the higher grades of cotton, especially in the Southwest, but offerings were light, and this was an important feature in the late advance in the price of the staple. Present indications are that there will be a good demand for the better grades of cotton throughout the season, which will probably serve to increase their premium over low grades later in the season.

According to official and private information the best crops this year are to be found in the South Atlantic states, especially in the Carolinas, where the yield is large and grade of good quality. The Mississippi Valley states have good crops also, but not so promising as the South Atlantic states, but, of course, the staple is far superior in the river sections of the central portion of the belt. It is said that Oklahoma will not make much over a half crop, owing to the serious damage done by the drouth, and Texas prospects, at the moment, are for a yield of about 20 per cent less than last year's production, although if killing frost is late this fall in North Texas, the state might make a much larger crop than now generally expected. Last year Texas made 4,862,000 bales, Oklahoma 1,051,000 bales.

Exports from all ports thus far this season total 434,000 bales, against 288,000 last year, and spinners takings by the world thus far this season aggregate 522,000 bales compared with 410,000 one year ago. It will be seen therefore, that exports thus far this season, as well as spinners takings, are in excess of even date last year, which is a rather bullish showing considering that prices are two cents higher than one year ago.

"Lord Chesterfield said: 'Great talents, such as honor, virtue, learning, and parts, are above the generality of the world; who neither possess them themselves, nor judge of them rightly in others; but all people are judges of the lesser talents, such as civility, affability, and an obliging, agreeable address and manner, because they feel the good effects of them, as making society easy and pleasing.' "

THE YARN MARKET.

The close of the August business in yarns showed the results for the month better than had been expected. The business for the month surpassed that of 1912, and while the demand for weaving yarns was not so strong as that for knitting yarns, still there were sales of weaving yarns in quantities of 50,000 and 100,000 pounds. With the opening of September came the higher raw cotton prices which tended to lessen yarn transactions so far as new business was concerned. Taken as a whole, the volume of the business during this period was much below normal and the buyers were not looking for much better than this until conditions became more settled. Underwear manufacturers were comparatively well covered on yarns, although some of them offered to buy at the old prices, takers could not be found at that time.

Hosiery manufacturers were reported to have a fairly large duplicate business on fall goods and were better buyers of carded yarns than either underwear manufacturers or weavers. There were some sales of moderate quantities of 14's to 20's Southern frame spun cones for spot delivery on the basis of 21¾ and 22 cents for 10's. At 21¾ cents sales were made in quantities ranging from 10 to 20 cases. There were also a few sales of 14's to 18's for late September deliveries on the basis of 21½ for 10's. There was still a fair demand for single combed yarns, but two-ply yarns were very quiet.

As the month wore on, the business became more spotty in weaving yarns, some of the dealers doing a fair volume of business. Spinners of knitting yarns were well sold and held prices very firm, one spinner quoting 8's and 9's Southern frame spun cones at 22¼ cents flat for quick delivery. For spot delivery 22 cents on the basis of 10's was the general price for coarse numbers. Hosiery manufacturers bought yarns for both spot and future, and high grade Eastern yarns were in fair demand. The demand for two-ply combed yarns was still light and dealers who make a specialty of such yarns said they did not see much chance for immediate improvement as the users were pretty well covered for the season.

As the month closed there is a fair volume of business being put through for both divisions of the yarn market, the buying for weavers, however, ranging from a few bales for spot delivery to 200 or 300 warps for October and later delivery. Knitters are buying in quantities ranging from a few cases for spot delivery to 100,000 pounds for later deliveries. Prices are steadily advancing and the bulls believe that they are going much higher. Spinners of underwear yarns are reported to be well sold up in the majority of instances, and one spinner quotes 10's Southern frame spun cones at 22 cents and predicts that they will go to 27 cents before the season is over. Sales of 12's and 18's Southern frame spun cones were made on the basis of 21½ cents, while 20's sold for 23½ and 24 cents, the last named price being for spot delivery. 24's are selling at 25 cents, 26's at 25½ cents, and 30's at 27 cents. There is a fair demand for single combed peeler cones, but there is a wide variation in prices quoted. Southern spinners who have booked a fair volume of business, are not pushing sales. Sales of 14's to 20's Southern frame spun combed peeler cones for November and later deliveries are being made on a basis of 26 and 26¼ cents, 24's combed are selling for 29½ and 30 cents, and 30's combed for 32 and 32½ cents.

The demand for two-ply combed peeler cones was not strong. A sale of 36's two-ply was made for 39½ and 40 cents and 40's two-ply sold for 41 cents. Sales of 50's two-ply were made for 46 and 46½ cents, and 60's two-ply sold for 51 cents. A sale of 80's two-ply skeins was also made for 68 cents. There was very little doing in mercerized yarns during the month, although dealers are still looking for an improvement. A sale of approximately 20,000 pounds of 80's two-ply mercerized cones was made at 80 cents and 40's two-ply sold for 53 cents.

Following are recent quotations on the Philadelhpia market:

Southern Single Skeins.

4s to 8s	19½@20½	16s	22 @22½
10s	20½@21	20s	23½
12s	21½	24s	25
14s	21½@22	30s	26

Southern Two-Ply Skeins.

8s	20½@21	24s	25
10s	21 @21½	20s	25½
12s	22	30s	26
14s	21½@22½	40s	31 @34
16s	21½@22½	50s	38½
20s	24 @24½	60s	46

Carpet and Upholstery Yarn in Skeins.

9-4 slack	21½	8-3-4 hard twist	19 @19½
8-4 slack	21		

Southern Single Warps.

8s	20½	20s	23½
10s	21	24s	24½
12s	21½	26s	25
14s	22	30s	26 @26½
16s	22½@23	40s	32

Southern Two-Ply Warps.

8s	21½	24s	25
10s	21½@22	26s	25½
12s	22½	30s	26½@27
14s	23 @23¼	40s	32½@33
16s	23½	50s	39
20s	24 @24½		

Northern Two-Ply Carded Peel Skeins.

20s	26 @26½	36s	32
22s	27	40s	34½
24s	27½	50s	40 @41
26s	27½@28	60s	50
30s	29 @29½		

Two-Ply Combed Peeler Skeins.

20s	29½	50s	45 @46
24s	30½	60s	51 @54
30s	33½	70s	60 @62
40s	41 @43	80s	68 @70

Single Combed Peeler Skeins.

20s	28½@29	40s	40
24s	29½@30	50s	45
30s	33	60s	52 @55

Southern Frame Spun Yarn on Cones.

8s	21 @21½	20s	23½@24
10s	21½@22	22s	24 @24½
12s	22 @22½	24s	25
14s	22½@23	26s	25½
16s	23	30s	26½
18s	23 @23½		

THE KNIT GOODS MARKET.

The knit goods market for the past month has been in good form, although the sudden rise in raw material prices forced the yarn up to a point where knitters were loathe to do much buying. The early part of the month found underwear manufacturers well covered on yarns, but hosiery manufacturers bought to a fair extent. They were reported to have booked a good duplicate business and must needs have the yarn. The increasing cost of production was reported to be giving more concern to underwear mills than the raw material situation, although both tended to increase the cost of production. It is probable that this advance in the cost of production may mean a difference of 25 cents a dozen on some goods. Many of the New York mills are having great difficulty in securing a full production anyway as when the labor shortage is combined with the shorter working hours that is compelled by law, it is making great inroads in the cost of production to knit underwear manufacturers.

As the month wore on, hosiery manufacturers continued to buy yarns for both spot and future delivery, even at the advanced rate, because of sales made ahead. Selling agents handling cotton underwear were being forced to mark up their prices sharply and low price balbriggans, which ordinarily retail at 25 cents were advanced from 5 to 7½ cents a dozen, while cotton ribbed goods and fleeces which retail at about 50 cents a garment, were up 10 cents a dozen. Knit goods buyers were finding a very marked shortage of fall goods and many were turning their attention to lines for next year as they feared they would again be caught in the same position. Prominent knitting mills were well sold already and in many cases it was not easy to increase spring delivery. Buyers of cheap lines of balbriggan goods were short and some buyers were turning their attention to the medium and better qualities, and in a number of cases were forced to fill out the holes in their lines with goods of this sort.

A considerable amount of duplicating continued in the various lines of knit goods, particularly in both cotton and wool sweater coats. A distinct improvement has been seen of late in the demand for sweater coats, especially in the demand for ladies' goods. All probable tariff effects will not be felt completely before the fall of 1914. There is an unusual demand for loud or high colors in all kinds of hosiery, in low as well as high grade, also in many of the sweaters for fall. Some of these colors are so pronounced that they immediately attract attention as soon as they come into sight. The most popular of the new colors is emerald green, with old rose and dull rose following. Other colors that are popular are cerise, purple and taupe. In sweaters the same colors are shown with emerald green popular, while old rose divides the field with cardinal.

As the month closes it finds the hosiery market both in staple cotton and silk lines disturbed by the radical advances in the raw material. A number of the mills have gone as far as they deem wise in selling goods on the old basis and they have now either advanced prices or else temporarily withdrawn until the situation becomes more settled. A number of mills making staple cotton hosiery have marked up their prices from 2½ to 5 cents a dozen on the advance of cotton. In the silk line there have also been a few advances already, particularly in those instances where the prices were low anyway. In the underwear line, those mills which are well stocked with the business either for the present or for next spring are generally asking and securing higher prices than the opening indicated. The state of the cotton market alone might explain the advances, but other manufacturing costs enter into the final results as was indicated earlier in this letter. That buyers appreciate such a condition of affairs is evident as they are paying 10 to 15 cents a dozen higher for fall goods, which a short time ago they refused to take at the lower prices. Reports from a number of mills show that they are having difficulty in getting the full production and while lines for next fall are being arranged there is scarcely any mention being made of that fact at the present time as this present season is so far very incomplete. It is probable, however, that prices will be high. Much interest is being expressed as to the probable result of the new tariff and while nearly every one thinks that any effect it may have will not be felt until the fall of 1914, still there is much guessing on all sides.

COTTON MANUFACTURING.

UTILIZING COLORED COTTON WASTE.

(Contributed Exclusively to Cotton*)*

BY WILLIAM B. NANSON, F. C. S.

Competition in the cotton trade is now so severe and the margin of profits so small, that one cannot afford to neglect the slightest matter of construction, equipment, or subsequent operation, that may make for the efficiency of the mill, the economical operation or the quality of its product. Technical (and by technical I mean practical and not the callow technology of the schools) and commercial training, combined with foresight and a thorough knowledge of human nature, are also prerequisites to success.

In this connection it may be safely said, that 50 per cent of all industrial failures are due to two causes: first, an incorrect conception, by the management, of the costs and profits of their business; and second, a lack of knowledge of how to utilize and convert into finished goods their waste products. The first is illustrated by the almost universal indifference exhibited by cotton mill managers to the aquisition of any exact knowledge of the unit cost of their products. This is fatal to their financial success, for, while it is comparatively easy to collect data in any mill to show the total cost of making a pound of finished goods, it is a difficult, but essential feature of efficiency management requiring a close study and a careful record of details, as well as a wide experience with results, to draw correct conclusions as to the cost of any particular process used in all the various processes pertaining to the manufacture of that particular pound of finished goods. This is especially the case where the mill is making a wide variety of colored or fancy goods, some of which may be profitable enough, while others are being produced at a loss.

To remedy this first evil, a practical and at the same time a thorough and correct method of ascertaining the unit of cost of every pound of material produced in the plant, and at any point in its manufacture, must be inaugurated, so that the management may easily determine where the leaks are and apply the necessary efficiency methods to stop them. An exact knowledge of unit costs will reveal at once the weak spots in any manufacturing plant, and by exposing their presence enable the manager to strengthen them; and to solve the problem of attaining these conditions is the duty of every executive. The task is not a simple one, and it takes considerable ability and a wide experience to draw the correct conclusions as to the proper proportionment of expense to be charged to each particular grade of goods that may be going through the mill.

No simpler expedient, in my estimation, has been devised in this connection than the establishment of a unit cost for every product of the mill. What does it cost, separately, for labor and material, to make one pound of 14s yarn? What does it cost to make one pound of 4-hank roving? What does it cost to dye one pound of raw cotton, red, and so on, for every unit in the mill. These items may be apportioned in the shape of percentages and the separate items under fixed charges and operating expenses become factors in the total. All this is necessary to success for, without this knowledge, I have known managers to endeavor to make certain unprofitable lines of goods profitable by tinkering with the cost at the wrong places and thereby making matters worse.

Let us assume, for example, the following apportionment of cost for making one pound of goods taken from the unit costs on one record: Material, 60 per cent; labor, 20 per cent; light and heat 1 per cent; power, 4 per cent; transportation, 2 per cent; office expenses, 2 per cent; repairs, 1 per cent; interest, insurance and depreciation, 10 per cent.

In this case, a manager, not keeping records of cost and knowing only the general cost of one pound of goods, in the whole mill might, and probably would, try to reduce the labor cost, not necessarily by reducing the wages, but by reducing the number of processes, whereas, if he had the unit costs before him, as in the apportionment of percentages, they would clearly indicate that the percentage of material was excessive, and that it must be in this direction the reduction of costs should be made.

This outline would have shown the management at a glance that material was the largest item in the cost and that any economy that could be affected in this direction would make an appreciable saving; and further, that it would make for efficient economy to increase, rather than decrease, the cost of labor, say, 10 per cent if, by so doing, it were possible to reduce the cost of material 10 per cent; in other words, it might be advisable to expend two dollars extra in labor to save six dollars' worth of material.

Now, the most efficient method of reducing the cost of material in a cotton mill is to eliminate the waste; and, if by expending two dollars for the extra labor and machinery required to do this, one can save six dollars in material, then we have achieved something along the line of industrial efficiency.

With regard to the second evil, the lack of knowledge of how to utilize the waste products, I believe that is one of the greatest problems in cotton mill management, and the one the least understood or appreciated by the average mill manager—in this country, at least, is the conservation and utilization of the waste products of the mill. In this article, I shall confine my discussion to the consideration of colored waste, or waste made from dyed yarns or cotton as made in mills manufacturing coarse or medium colored goods, plaids, ginghams, shirtings, cottonades, etc., and I shall endeavor to show how this colored waste may be conserved and worked up into cloth and the item of waste, as a loss to the mill, be entirely eliminated.

First of all the manager must start in with the determination that whatever waste is made must be properly cared for, and nothing lost; that whatever waste is made must be kept clean and in good condition for working over. He must look carefully over the waste being made and instruct his men *how* he wishes it cared for. All small pieces of clean cotton should be *picked* up from the floor, and not swept up; the spaces between the machines should be swept only once a day, and the whole day's sweepings put where he can look them over; he must never allow any dusting to be done by swinging a rag or a broom about and blowing the fly and dirt into the working parts of the machinery;

and he must see that the waste and fly are not made dirty by being swept along the floor with a broom. A vacuum cleaning tube is the ideal thing to use for picking up fly and loose fiber.

In the picker house and card room every particle of fly and lint must be extracted from beneath the pickers and cards and in the dust room and made into yarn. The manager should not consider himself too dignified to look into these small details; he should remember that there is a certain greatness in the infinitely little and that this is a good frame of mind for him to cultivate. Apparently trivial things have in times past revolutionized a science, and nothing is too small to be worth looking after.

It must be borne in mind that 20 to 30 per cent of waste, which shows bad management, but is common enough, not only means the loss of the costs incurred in the making of it, which is a serious item in colored waste which has undergone the extra cost of dyeing; even if this waste could be sold for the market value of the cotton, we should consider the money expended in preparing and dyeing it.

Every colored cotton mill making coarse goods, or in fact, as fine as 20s yarns, ought to make, pound for pound, as large an output, by weight, of *unfinished* goods as will balance the weight of cotton used. In saying this, I mean the cloth or output as it comes from the loom, and not after it has been weighted and manipulated in the finishing room, where it can, of course, be easily increased in weight from 20 to 30 per cent, or more; in other words, a colored cotton mill, making cloth, should make *no net waste*, except, perhaps, the bagging and ties, and this is all the waste it should have to sell, and even the ties can be used on bales of finished goods intended for some purposes. That this condition of affairs is possible is a matter of record, for the writer was manager of a mill in Canada for a number of years running 900 looms on both colored and white work, and spinning numbers from 6s to 40s, and the average of net waste was only 3.50 per cent over all, including bagging and ties.

Colored waste after being carefully picked up—not swept up, and otherwise kept as clean as possible, should be taken to the waste house and sorted into its various grades. Rags, cloth ends, and seams, cuttings and clips of woven material, must be put by themselves and subsequently converted into fiber by one of the many styles of shoddy pickers or garnetting machines which are sold for this purpose. A Kitson shoddy picker will shred up about 500 pounds of rags per day.

All the thread waste, cop waste and weave and slasher room waste must be run through a 5 section waste breaker as also must all the shredded rag waste from the shoddy picker. This product from the waste breaker is known as cop waste. If there is any slasher waste or any rags or warp waste from the weaving room, or cloth rooms and cuttings that have been sized either on the slasher or in the finishing department, the size will have to be removed before running the stock through the shoddy picker or the waste breaker. This can be done by first steeping the stock 4 hours in a 2 per cent solution of diastase, then boiling 2 hours in the same liquor with the addition of 4 per cent of soda and thoroughly drying. The stock can be made to increase sufficiently in weight by the operation to pay all the process. Where the stock is dyed in the raw stock, the fly and dust from under the pickers, dust chamber and cleaning trunks, as well as the fly and sweepings from the card room, the cylinder and doffer strippings and all scavenger or cleaner waste must be thoroughly cleaned by running it through a card and picker waste cleaner. This machine should be furnished with a thread extracting device to extract the hard waste threads. These, if left in, will cause serious trouble in the subsequent carding and spinning operations. This machine will thoroughly clean about 2,000 pounds daily and deliver the stock in a continuous sheet.

Owing to danger from fire, I would say here that all waste breaking machinery, shoddy pickers, waste breakers and card and picker waste cleaners, should be placed and operated in a fireproof building separate from all other buildings.

The top flat strips and roving waste made from colored stock may be put right back into the regular mixing without further process. If possible to do so, mix them with stock of the same color and use them over again as good stock; do not treat them as waste unless there is nothing of the same color to mix them with. In this connection, it might be well to say that all cards must be thoroughly stripped and cleaned when changing from one color to another.

When the waste is reduced to workable lint, there are several ways in which it may be used, always remembering that it must be spun into filling only.

First, it may be spun into yarns as fine as 10s and used for filling for ducks or drills that are to be subsequently dyed or bleached in the pieces.

Second, it may be spun into yarns as fine as 16s and dyed in the hank into dark brown, navy blue or black, then quilled and used for filling for plaids, cottonades, etc.

Third, a skillful designer could employ it just as it is, without dyeing, as a filling for the background of plaids, domets and shirting, using three other colors for the check or pattern, for instance a striped domet with all colored waste filling would be a novelty, using white and colored stripes.

Fourth, after running into laps on the opener and breaker picker it could be mixed with laps of black or white on the finisher or lapper in almost any combination or proportion and used for either warp or filling as fine as 16s, provided that not more than 50 per cent of waste is used in laps intended for warp. In this way many delicate shades and mixtures of drabs, grays or modes, can be made, for instance,—one lap of black, one lap of white and two laps of waste on the finisher picker when made into mock twist on the roving frame with one end of white produces a very desirable filling mixture for baby flannels. One lap of waste and three laps of white cotton makes a French white, and this made into a mock twist on the roving frame with one end of black may be spun into filling for blue denims, it gives a much better effect than a black and white mock twist and would enable a denim mill to use up all its waste.

After cleaning the waste and reducing it to workable fiber, it should be well mixed in about the following proportions: 30 per cent picker waste, 30 per cent cop waste, and 40 per cent card strips. The mixing must be well and carefully done, especially for colored waste, as there are so many lengths and colors of fibers contained in the stock. Remember that good mixing is the foundation to good carding. To insure this, a bale or bag of each of the three kinds of waste mentioned should be opened near the feeding apron of the bale breaker and fed to it in alternate armfuls from each one, and spread in layers all over the pile in the bin. Mix at one time a pile large enough to

run the breaker picker a month if possible, the object being to make a large quantity of the same stock and color at a time, for it must be borne in mind that all the yarn made from one particular mixing will be alike in quality and color, while that from another mixing, no matter how carefully assorted and mixed, will be different. No two lots will be just alike, and if used for filling they will not match in color if woven into the same piece of goods; however, if the goods when woven are going to be bleached or dyed in the hank, it would be of little consequence, but in any case it is always desirable to have the yarns as evenly matched in color and quality as possible.

After being mixed in as large a pile as the bin will hold, it should be fed to the next machine from the sides. The fiber must be raked from the top to the bottom of the pile with a short-toothed iron rake, and this, when fed to the next machine, thoroughly mixes all lengths and colors, the mature and the immature, the strong and the weak, into one homogeneous mass in color and strength.

It is quite obvious that waste should be strained and beaten as little as possible in the pickers; moreover, it is necessary to beat it much less, as it has been thoroughly cleaned in the previous waste-breaking processes. When cotton fiber is strained through overworking, its convolute power is destroyed, the bearded or corded edges are, to a great extent, worn off, and the fibers fail to interlock when twisted together. This condition makes them lose their cohesiveness and glide over each other and easily pull apart when spun into yarn. It goes without saying that this greatly impairs their strength and lowers their value, and may be considered as a characteristic feature of all waste yarns to a lesser or greater degree. Hence, it will be seen that all treatment beyond that necessary to disentangle the fibrous mass and wind it onto an even lap for the subsequent carding process, ought to be sedulously avoided. In view of this, I advise only one process of picking for cotton waste.

The stock should be run through a single beater breaker lapper with a 30-inch Buckley cylinder section, automatic feeder and feed regulator and made into 14-ounce laps. Aside from the fact that waste should not be beaten excessively in the picker room, a much more even lap can be made upon the first machine. When the fiber is fed regularly by an automatic feeder and a given weight is delivered to the beaters by a cage section and eveners, these can be made upon a finisher lapper where 4 laps are doubled into one.

The advantage of feeding a finishing picker from three or four laps doubled, is much exaggerated. As a means of evening up the finished lap, it is by no means so beneficial a practice as supposed. The even weights of the laps depend much more upon the feed regulator. It is the common theory that if three or four laps are doubled and fed together, some special Providence will cause the thin places in one lap to counterbalance the thick places in another, but it is just as probable that two or three thick or thin places may come together at the same time as otherwise.

From the foregoing remarks the reader will be prepared for the very strong and somewhat revolutionary statement that cotton waste is best when opened and finished at one operation in the picker room.

In cases where mixtures have to be made in the picker room, a finisher lapper *must* be used after the breaker picker to mix the various combinations, but as I said in the earlier part of this article, it would be better if the designer would get up patterns that would use up the colored waste solid and without further mixing.

It is also well to establish a hard and fast rule for the picker room, *viz.*, that all laps *must* be weighed before going to the cards, and if they vary from the standard weight more than half a pound in either direction, *i.e.*, too light or too heavy, they must be put back into the mixing and run over again. This subject of waste will be given further attention in a later article.

DESIGNS FOR FANCY COTTON FABRICS.

(*Contributed Exclusively to* Cotton).

BY THOMAS WOODHOUSE AND JAMES IRELAND.

PART THREE.

All the effects which appeared in Figs. 5 and 7 are represented individually in the six simple weaves in Fig. 11.

A is the 2/2 straight twill to right.

B is the 2/2 straight twill to the left.

C is what is usually termed the 2 by 2, or the 2/2 basket or hopsack.

D is the 2 by 2, or 2/2 warp rib.

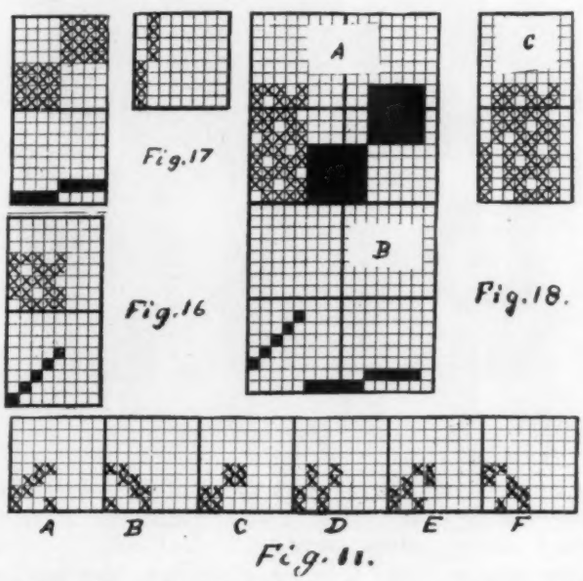


Fig. 17 Fig. 16 Fig. 18.

Fig. 11.

E and F are the 2/2 broken twills or crepe weaves. All these weaves may be reproduced in the cloth by using the same tappet, *i.e.*, with the same weaving plan, provided, of course, that the draft in the harness is changed to suit the different effects desired. If, for example, the weaving plan be the same as design A, the tappet would be built accordingly, and may be used for all, but the various drafts in the harness would be as follows:

Design	Draft of Harness.
A	1.2.3.4 Repeat for desired width.
B	4.3.2.1 " " " "
C	1.1.3.3 " " " "
D	1.3.1.3 " " " "
E	1.2.4.3 " " " "
F	3.4.2.1 " " " "

In many cases, and particularly where the warp is all one color and where a slight overlapping in any pair of threads is unimportant, weaves C and D can be woven with

the same draft. It would only be necessary to tie double threads to those which have already been used for weave D, using all if there are as many double threads in C as there are single threads in D, or if the sett be different, to drop the necessary number of pairs in the harness. Where, however, it is desirable that each thread should retain its individuality throughout, the draft should be as indicated at C, each separate thread being drawn through its own heddle. This is the way that the threads were drawn for the three patterns which are illustrated in Fig. 12. Each thread is distinct, although the threads run in pairs, and the group affords another illustration of the great difference in the prominence of the stripes when equal quantities of the two colors are used and arranged in a similar manner to those illustrated in Fig. 8 last month.

The subject of drafting is of so much importance to those engaged in the manufacture of fancy cotton fabrics,

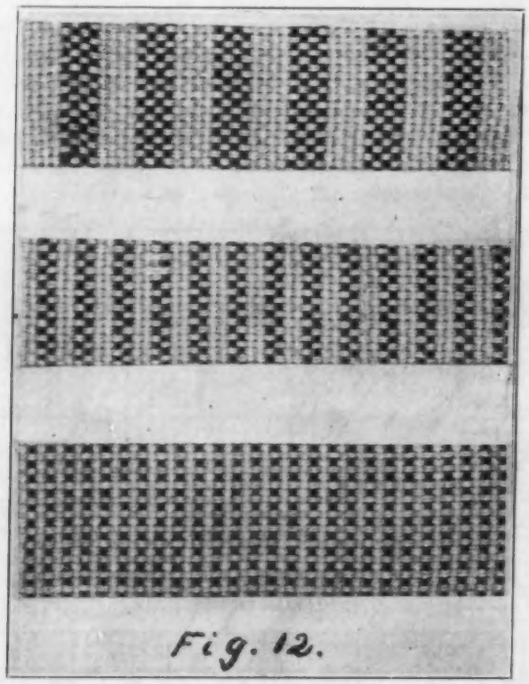


Fig. 12.

or even of comparatively simple fabrics, that we have considered it advisable to show in detail the different ways in which two simple designs may be produced. The two small plans at A and K in Fig. 13 represent two weaving plans. That A is the 2/2 twill to right, while that at K is the same twill, but directed to left. The table will explain the various parts:

Weaving Plan	Draft	Effect in Cloth
A	B	C
A	D	E
A	F	G
A	H	J
K	K	L
K	M	N
K	O	P
K	Q	R

On comparing the results it will be observed that each design is obtained in two different ways.

Fig. 14 is a photographical reproduction of four different stripe patterns, A, B, C and D, all of which are suitable for blouses, shirtings, aprons and the like. All the patterns are composed of two colors of warp—dark blue

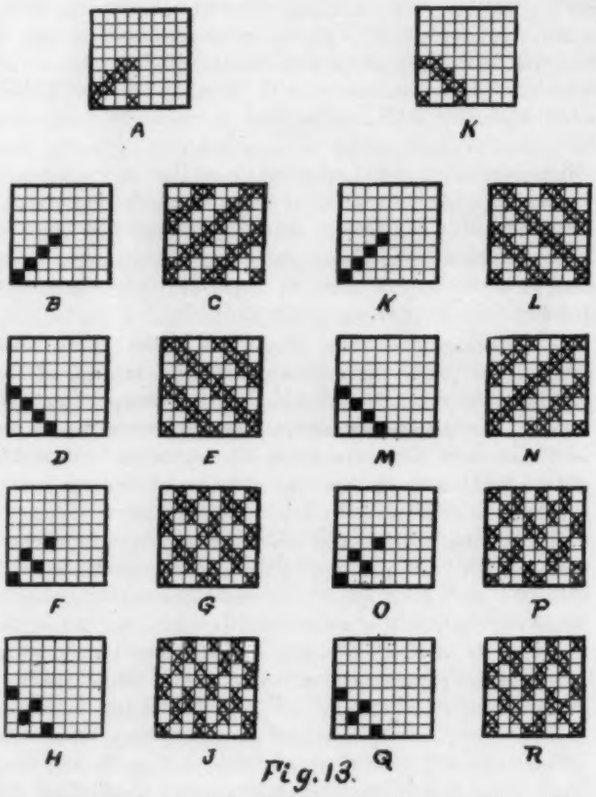


Fig. 13.

and white—and the weft or filling is all dark blue. The complete design, draft, and weaving plan for pattern A is illustrated at A, B and C, Fig. 15. The complete design occupies 40 threads and 40 picks; 20 threads of dark blue shown in crosses, and 20 threads of white shown in solids. The interweaving of the blue threads and the blue picks is in the well-known 5-thread sateen order, while the interweaving of the white threads and the blue picks is in the 4 by 4 basket or hopsack weave. Although the 5-thread sateen is complete on five picks, as shown in Fig. 16, the 4

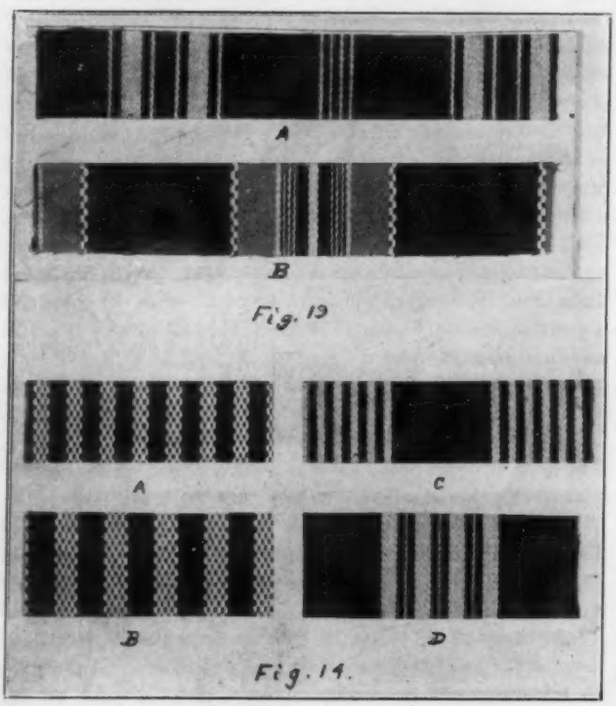


Fig. 14.

by 4 basket weave is complete on 8 picks, as illustrated in Fig. 17, when the two are combined in the same design as in Fig. 15, it requires 40 picks before the two units finish together on the same pick; in other words, the combined weave is not complete until we reach a number which is the least common multiple of the two unit weaves employed. Similarly, if three or more different weaves be used, the least common multiple of the three or more weaves indicates the number of picks which the complete design will occupy.

The weaving plan C, Fig. 15, for design A, requires 7 harnesses, 5 for the sateen stripe of blue threads, and 2 for the basket stripe of white threads. The draft to suit this weaving plan is shown at B. If, from a weaving point of view, it is considered advisable to operate the basket threads on the first and second harnesses instead of on the sixth and seventh harnesses, the last two threads in the present weaving plan would be placed in front of those which represent the sateen part, and the threads which constitute this sateen part would then be drawn on the last five harnesses, as illustrated in Fig. 15. And, naturally, all the basket threads would be drawn on the first and second harnesses. This would insure a better opening of the shed for the passage of the shuttle, as the basket threads would not have the same tendency to hang or droop in the shed. At the same time it is not so essential to place these basket threads at the front as it would be if the same threads happened to be weaving plain.

A considerable reduction in the number of picks would result if the 5 by 5 were used in conjunction with the 5-thread sateen. Thus, if the 20 sateen threads were drawn on the 3rd to the 7th harnesses, and then 20 threads on the 1st and 2nd harnesses, weaving plan C, Fig. 18, would be sufficient, and this plan is complete as shown on 10 picks. In the design at A one repeat only of the basket pattern and two repeats in the way of the weft of the sateen are shown, but it is easily seen that each section of the design as well as the corresponding sections of the draft B could be extended so that each occupied 20 threads. Of course, it is quite possible that the 5 by 5 basket would make the cloth too open, and our reason for introducing it is simply to show that a slight alteration in one of the weaves is sufficient to simplify the arrangement considerably.

When weaves occupy as many as 40 picks it is usual, if not essential, that they should be woven by a dobby machine. If the design in Fig. 15 was woven by an ordinary single cylinder dobby, the cards or lags would have to be cut or pegged for the 40 picks. If a double cylinder dobby were employed, the two cylinders might be arranged to work simultaneously, one cylinder carrying the lags pegged for the sateen weave, and the other cylinder carrying those pegged for the basket weave. With this arrangement, 8 lags for the basket and 10 lags for the sateen (one repeat of the basket and two repeats of the sateen, or two repeats of the basket and four repeats of the sateen, if each lag serves for two picks) would be sufficient. There may not be a very great advantage in adopting such a method for the pattern under consideration, but in some cases it would be an enormous advantage so far as time for pegging and number of lags are concerned.

The sateen part of the pattern illustrated in Fig. 15 might very well be woven with an ordinary 5-harness negative tappet, and the basket part be woven by one of the following methods:

(*a*) A Woodcraft or other positive tappet built for 8 picks to the round;

(*b*) A scroll tappet on a special supplementary shaft running at one-quarter the speed of the crank shaft, and thus giving the 4 up and 4 down movement;

(*c*) A dobby machine using two harnesses only, or a larger number if it is desired that this machine should be capable of producing other weaves besides the basket.

Pattern B, Fig. 14, is very similar to the one which we have just described, differing only in the width of the stripes. The pattern is complete on 58 threads and 40 picks, 30 dark blue threads for the sateen stripe, and 28 white threads for the basket stripe; the stripes are more pronounced than those in pattern A, since they are wider.

The stripes in pattern C, Fig. 14, are of an entirely different nature, and although formed of dark blue and white threads, the weave is the same in all parts. The complete pattern in the warp is arranged as follows:

		Threads.
Dark blue	115 + 10 + 10 + 10 + 10 + 10 =	165
White	10 + 10 + 10 + 10 + 10 + 10 =	60
	Total.....	225

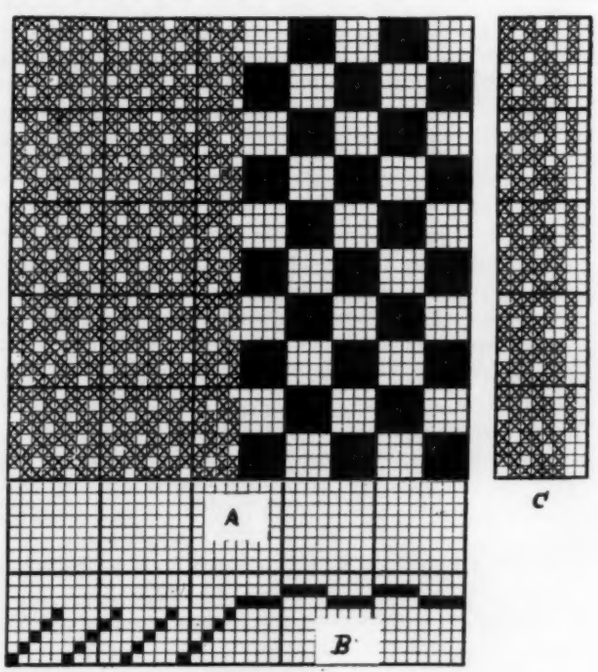


Fig. 15.

but if there were any complete number of repeats in the warp, it would be necessary to commence with 50 to 60 threads of dark blue at one selvage, and to finish with the same number at the opposite selvage, or in other words to split up the broad blue stripe so that both selvages would contain approximately the same number and thus appear symmetrical.

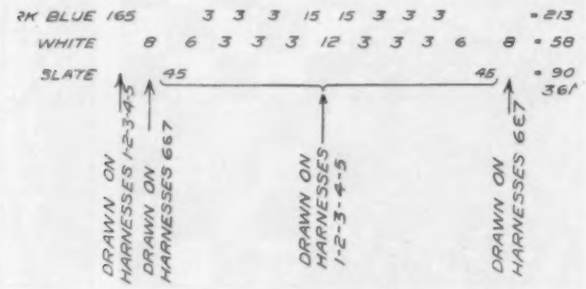
A slightly more elaborate wide stripe is that illustrated at *D*, Fig. 14, the warping arrangement being as follows: dark blue 90 + 9 + 9 + 9 + 9 + 9 + 9 + 90 = 234 threads, and white, 19 + 3 + 19 + 3 + 19 + 3 + 19 = 85 threads, or a total of 319 threads. The method of splitting the wide blue stripe is illustrated in this example, the two groups of 90 threads each coming together to make a stripe of 180 threads at every

repeat, but only half of the full stripe appears at each selvage.

In all the patterns illustrated in Fig. 14 there are 120 threads per inch in the warp and 64 picks per inch in the filling. Since all the threads in patterns *C* and *D* weave in the ordinary 5 thread sateeen order, 5 harnesses only will be required, and if the draft in the harnesses is straight which is highly probable, the design, draft, and weaving plan will be identical with those shown in Fig. 6.

Two stripe patterns of a more elaborate nature are illustrated at *A* and *B*, in Fig. 19. Pattern *A* is woven with the 5 thread sateen shown in Fig. 16, and the pattern which occupies 395 threads is arranged as follows: dark blue, 55 — 10 — 10 — 25 — 10 — 10 — 110 — 8 — 8 — 8 — 55 = 309 threads; white, 5 — 25 — 5 — 5 — 25 — 5 — 4 — 4 — 4 — 4 = 86 threads, or a total of 395 threads.

Design *B* is bold yet pretty, and the warp is composed of three distinct colors, while the filling for both patterns is dark blue. The whole of the pattern is woven with the 5 thread sateen weave with the exception of the narrow bands of 8 white threads at each side of the broad blue stripe. These threads weave in the 4 by 4 basket, and from what has been said with respect to the foregoing patterns the reader will see that the weaving plan illustrated at *C*, Fig. 15, would be quite suitable for the production of this pattern, provided, of course, that the threads are drawn in their proper order and on those harnesses shown immediately under the following warping particulars:



(To be continued.)

CLOTH ROOM METHODS AND MACHINES.

A Discussion of the Use and Abuse of One of the Mills Greatest Allies.

(Contributed Exclusively to Cotton.)

BY C. T. FALLIN.

It is my honest opinion that there is no part of any business enterprise so badly neglected, so thoroughly misunderstood, and so generally abused as the cloth room of our Southern cotton mills, and yet I am sure that a careful consideration of the subject will show no department of the mill of more actual importance than this same cloth room. I make the above statements fully aware that many good mill men will disagree with me in both premises, but it is these men especially that I wish to reach and I hope that through the medium of this series of articles I shall be enabled to tear down many walls of prejudice and convert to my way of thinking some of these skeptical ones.

Just here let me say that the above accusation is a general one and that I know there are some exceptions. Furthermore, I believe that the cloth room is gradually yet surely coming into its own, and it is a desire to assist in this movement, rather than a wish to criticise that induced me to accede to the courteous request of the editor of Cotton.

Having stated that the cloth room is neglected and abused, the burden of proof rests on me to make good my accusation. For convenience I will classify this charge into two discussions; external and internal. The external is the abuse from without. Abuse that is engendered by the mill management; by the other departments of the mill; by the textile press; and which is further exemplified by the general tendency of the mill public to belittle and to underestimate the importance of cloth room work and cloth room workers, from the overseer down to the sweeper boy. The internal abuse is that within and is due, in a large measure, to the incompetency of the average overseer or superintendent and sometimes both.

We will first consider some of the external abuses, and try to deal with the internal abuses in a specific way a little later. One of the most common and most far-reaching of the external abuses comes from the management of the mill itself, and is well illustrated by an experience I once had. A certain shearing and brushing machine in the room of which I was then overseer was badly out of repair and beyond the ability of the mill machinist to adjust and put it in shape to do the work for which it was intended. Several new parts were necessary so I took the matter up with the management. They refused to buy these parts, saying that the work done was good enough as it was. I then undertook to show them that it was doing almost or quite nothing at all, and so clear did I make it that they agreed with me, but still refused the supplies needed. I then suggested that we dispense with this machine entirely and save the power and labor costs, but in this I was also overruled.

Such incidents are included in the experience of every live clothroom overseer. At times when I have gone to a new position and suggested the adoption of a comprehensive and modern form of reports and records, it was only to be turned down on account of the expense. One place I remember I was not allowed even a blank "Bale Record," but was paid a good salary to make books from brown wrapping paper and rule them a page at a time by hand. At two other mills where I have served as overseer, I proposed detailed yardage baling slips, to be made out with carbon in duplicate, the original to be kept on file at the mill, the duplicate with all particulars packed in the bale, something akin to the system used in nearly all modern packing rooms, and sometimes even found in packages of smoking tobacco and cigarettes. At both these mills the idea was heartily approved of, but horror of horrors, I was made to use brown wrapping paper, and made to do all my ruling and wording by hand, only to send out to the buying world a very suggestive advertisement of these mills' indifference to detail. For the five-cent tobacco package a neat, well worded, well printed packing slip; for the case or bale of cotton goods worth one to two hundred dollars, a scrap of brown paper. Think of it! Nor were these mills specially penurious. They would spend money freely on repairing card room, spinning room, weave room and similar machinery; they had plenty of up-to-date office systems with supplies for same; and they spent large sums on the welfare of their operatives and were considered among the more progressive of the middle-sized plants.

The abuse by the management, however, does not stop with machinery and upkeep, but also includes proportionate wage allowances for clothroom help, from the overseer down. I have always contended that a first-class cloth room overseer was as important and worth as much to any mill as a first-class carder, spinner, weaver, or master mechanic, but few manufacturers agree with me in this opinion. Space forbids as complete a discussion of the subject as I would like to enter into, but I cannot resist the temptation to state briefly a few of my reasons.

The cloth room is the burden bearer of the entire plant. If the carder makes a mistake and allows doublings, singlings and uneven roving, etc., or the spinner allows yarns or colors to mix, or weights to go wrong, it's the cloth room man that must locate the trouble. It is the same with the weave room. He must find every mistake made by every one in the weave room, overseer, second hand, loom fixers, weavers, oilers, etc., and not only must he locate every other man's mistake and fault, but he must also assume the responsibility for these, as once the goods are beyond his hand he is responsible and the damage will fall directly on the mill in dollars and cents. Also, it should be remembered, that not only must he find the faults and assume the responsibility for them but, like Charity, he must cover a multitude of sins. How often have you who are familiar with the mill, heard expressions like these, "Oh, that's O. K. Let it go; they will fix it in the cloth room," or "Oh, h—l; that's nothing but oil—let them wash it out in the cloth room?" Have you ever been present at the mill where the percentage of seconds has gone up perceptibly? Who was the first man visited by the superintendent or agent? Why, the cloth room man, of course; and he is always questioned to know if he cannot fix up more places or ease up a mite on the inspection. Thus he has more responsibility direct and indirect than any overseer about the mill, and besides all this, a handicap not placed on others, *viz.*, impaired and inefficient machinery and comparatively poorly paid help, although it is only fair to say that the cloth room operatives in Southern mills are today getting better wages than was the case a few years ago. I have never yet been able to see why the weaving of goods was any more important than inspecting and preparing the goods for market. I have always claimed that a good cloth inspector or grader, a folder hand, or even press man, is worth more in dollars and cents to the mill than a good weaver or spinner or frame hand. Which is the most important, the making of goods that in many cases must be remedied at the cloth room, and which at the worst can only spell the difference between the selling price of firsts and seconds, or the handling of the finished product where any mistake will react to the direct and indirect hurt of the mill, directly in the loss of dollars and cents and indirectly in the hurt of the mill's reputation, which means the loss of sales in the future at profitable prices.

One mistake made by an inspector or grader will oftimes result in the cancellation of an order, or the granting of a concession that will result in the loss of hundreds of dollars, besides giving the mill an unsavory reputation with the buyers.

Not only is the cloth room discriminated against in the manner described, but also by the general mill populace as well. There seems a general idea that because the cloth room does not produce anything that can be measured by dollars and cents, that its product is practically finished at the loom, it is therefore a thing to be endured as an undesirable but necessary evil.

The discrimination shown by the press, and by the press I mean the book publisher and the trade magazine, by their apparent indifference, do the cause great injustice. We can find books galore on card setting, speeder adjustments, spinning frames, looms, etc., but how many on cloth room machinery? Columns upon columns have been written on the opening room and the pickers, and yet are these machines, intended for the proper beginning of cotton manufacture, any more important or any more difficult to understand than the brusher and shearer that must clean and prepare the finished goods for market? Look at all that has been said and written about the loom, and yet is a loom more difficult to adjust or more complicated to understand than a folder or yarding machine? If inclined to doubt this statement, ask a man who understands both machines, or put your best loom fixer in the cloth room to put a folder in shape that is out of fix, and see how soon he will do it. Nor is the loom of more relative value to the profit and loss account of the mill ledger than the folder. Let the folder be set to give the wrong yardage, too much or too little, and the mill will be caused to bear the loss. If the buyer is given too much goods he will, because of self interest, be mum; if given too little, he will for the same reason raise a row and must be satisfied, ofttimes with compound interest on his real loss.

The attitude of the press is not only discriminating, but much of what has been printed is erroneous and sometimes worse. In one of the text books published by a correspondence school, and in a very lengthy article on folder adjustments and on goods failing to hold, the two most common causes of this defect are not mentioned at all. Recently I read an article by one of the members of a firm manufacturing the best and most commonly used folding machine on the market. In this article, while giving directions to remedy a machine that refused to hold cloth at one corner, he advised using a pasteboard *"shimie"* placed under the table and on the table frame at this particular corner. This, of course, will do it, but his machine designers have made ample provisions for another remedy that will cure the defect, yet not bring another and sometimes worse evil.

While I have my little hammer going, and before I enter into the real vitals of these articles, I want to give one gentle rap to some of the manufacturers of cloth room and finishing machinery. Manufacturers of card room, spinning room, and weave room machines—many of them, at least—get out handsome catalogs and not only tell what their various machines will do, but tell how to make them do it. Many of these catalogs are of more real value and technical worth than some of the text books upon the same subjects. But to date I am ignorant of but one manufacturer of finishing room machinery making any such attempt, and this one attempt is but a poor disjointed makeshift, printed on dozens of circulars and requiring no end of needless reading to reach the information desired.

Recently I wrote the manufacturers of a certain kind of napping machines for information as to how to set their machines for different kinds of goods. I was treated very courteously, indeed, and they sent a number of circulars and catalogs, all of which told one thing, and only one, *viz.*, the merit of their various machines, written from a selling standpoint only; but, alas, utterly devoid of the information I so greatly desired! Surely they could have said something on the various settings for domets, flannelettes, outing, canton flannels, etc., at least it appears to me that if

I had thousands of dollars invested in the manufacture of napping machines, I would be interested in seeing that my machines made good in the hands of the present users as well as trying to sell them to prospective users. This important art of napping is fast becoming one of the first in the cotton goods trade, but inquiries sent to various sources, several to prominent trade journals, machine manufacturers and one to a correspondence school, all failed to produce for me the name of a book on this subject of any real value.

Having now criticized and knocked sufficiently to call attention strongly to the facts outlined, the subsequent matter with which I expect to follow this section will be devoted to the ways and means necessary to reform many of these and other faults.

KNITTING.

THE WORK OF THE CONDITIONING HOUSE.

(*Contributed Exclusively to* COTTON)

BY WILLIAM DAVIS, M. A.

If the average textile worker be asked about the idea which the words, "Conditioning House" suggests to his mind, he will generally describe a place where a few experts are engaged in a small room and where experiments are conducted of very little direct advantage to the trade. Judge of his astonishment when he is conducted to a huge building such as they have in Bradford, four stories high and showing a great array of windows. On any working day may be heard the sound of big cranes and loaded lorries engaged in the transit of material which is dealt with by the authorities. Some idea of the work may be gleaned by the fact that in the Bradford institution some 130 persons are kept in constant employment.

The general impression is that the opinion of the conditioning house is only sought in case of dispute, but an examination of the tests made will suggest other directions in which it is useful. In 1894, the third year of its existence, the weight of material passed through was about 8½ million pounds, and the number of tests made nearly 23 thousand. In 1911, the weight of goods passed through had risen to 96 million pounds, and the number of tests had risen to 238 thousand. At present the authorities are passing plans to build an addition to their premises. Such a steady increase going on every year speaks for itself and leads one to inquire what is the service which it renders to the trade.

As all are aware textile materials have a capacity for holding a considerable percentage of moisture without appearing moist, a property which is known as hygroscopicity. The capacity is found to be greatest in wool, some varieties absorbing in a suitable atmosphere as much as one-third of their own weight in moisture. The amount present depends on the humidity of the air, but under normal conditions the percentage should not be more than 20 per cent, this being found to meet the requirements of the normal healthy condition of the fiber. Thus it will be seen that considerable latitude exists with regard to moisture which is possible to have in a lot, and it is the margin which is of the utmost importance to the buyer. If the amount of moisture be increased beyond the normal, the material being sold by weight becomes more expensive because the extra moisture has to be paid for at the same rate as good yarn or material.

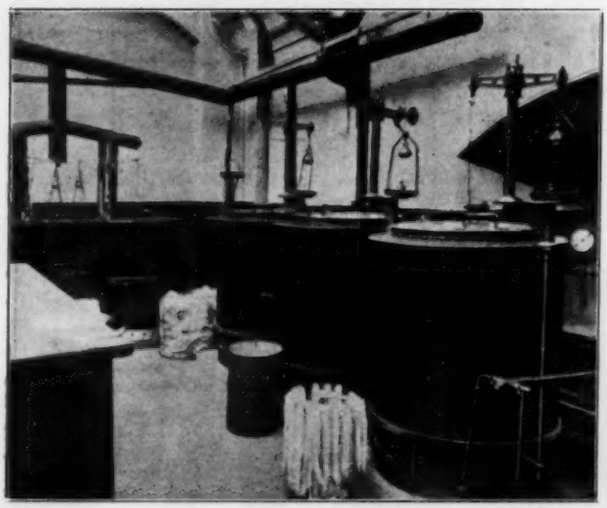
Altogether apart from the fact that it is possible for merchants to take advantage of this excess of moisture, the margin is one which causes a feeling of insecurity to the entire trade, and here the conditioning house steps in and imparts confidence. It is significant that the continental manufacturers were the first to take the matter up, Roubaix in France being the first to establish a conditioning house. Sir Swire Smith, the prominent Yorkshire manufacturer, has stated that previous to this time Bradford's trade with the Continent was very limited, because the foreigner had no confidence in the methods of buying and selling. Since the establishing of the conditioning house in Bradford, confidence has been established and the business has gone up by leaps and bounds. Thus we find that the greatest bulk of the work done by the Bradford house, is done in the conditioning of worsted tops. The conditioning operation has become a usage of the trade and manufacturers send tops in the bulk for testing and storing until they are required to be delivered. It should be explained to the uninitiated that the spinning of worsted yarns is done in specialized sections. What is known as the top-maker receives the wool and proceeds to pass it through the various operations of scouring, testing and combing. The combed sliver which is now ready for the spinner is supplied to him under the name of top, these usually being delivered in balls of a uniform size ready for placing on the machines which are to begin the attenuation of the sliver which is the start of the thread proper. It has become prevalent for the top-maker to send his goods to the conditioning house to be tested for moisture, and the report of the tests is sent with the material and the sale is effected on the percentage of moisture actually found to be present.

Although the testing of tops or combed worsted fiber forms the bulk of the work done by the conditioning house of Bradford, it by no means represents the full extent of its activities. Important departments are in constant operation for testing the moisture and grease present in raw wool, yarns and cloths. Yarns are tested for counts, strength, twist and evenness of spinning. Cloths are examined as to defects of weaving, composition of material, etc.

The operations of the institution are characterized by extreme thoroughness in detail, a point on which very great stress is laid. This is evidenced by the skill shown in weighing the samples, the care with which they are selected. Taking the tops, for instance, the test is made on one pound of material, and this weight is obtained by taking a portion from the outside, from the inner portion and from the very center, respectively. The same method is carefully adopted in dealing with bales of wool and bobbins of yarn. In the case of a bobbin, this condition is fulfilled by winding a portion from the outside, then a section is unwound and a further testing portion unwound, the operation being repeated another time for the third part, which is selected from near the core of the bobbin. When yarns are tested for moisture, it is noteworthy the care which is taken to have them wound at even and regular tension into the

form of hanks. A graduated set of weights are used to tension different kinds of yarn and the hank is never wound beyond the point where it will overlap to any extent and so give uneven results. Another commendable feature which is conducive to the greatest accuracy is the manner in which the results are checked by more than one person. Each test is made by at least two separate individuals, and if the figures show too great a deviation, further tests are made before the final result is issued.

Other sections of the conditioning house are none the less interesting. They have a section for testing the exact composition of yarns and cloths, and it may be divided into two departments—the physical and the chemical work. For the former, quite an interesting contrivance is the table which is used as a kind of perch for webs of cloth. It consists of a table with a dim glass top having directly underneath a series of strong electric lights which are turned on so as to shine through the cloth and show irregularities of weaving over a yard or so. Thus the causes of shaded pieces and thick and thin portions may be at once detected. The strength of the lights which shine through the dim glass table top can be regulated to a nicety for any brilliancy. The table can be turned on end and at once serve as a perch for the web. A modification of this is found sometimes on the desk of those who require to analyze cloth patterns in factories, when a piece of dim glass 3 inches square can be placed in the desk and a small light arranged underneath. This can be turned on and used when it is required to analyze the cloth.



Drying Ovens for Raw Cotton, Yarn, Wood Pulp, Etc.

In recent seasons in the British knit goods trade there has been great difficulty in securing enough material of the goat, camel and sheep class, such as mohair, alpaca and cashmere, and resort has had to be made to other fibers, such as horse hair and such inferior fibers to make up the quantity. Yarn agents and manufacturers have often been at a loss to find out the percentage composition of the respective materials so as to arrive at a knowledge of their real value. One of the workers during our visit to the conditioning house was busily engaged in solving this very problem. The method of procedure is as follows: It is first ascertained what classes of fibers are actually present in the yarn and then the official proceeds to separate out the various fibers by hand, fiber by fiber, until the several heaps are large enough to be accurately weighed. The percentage is then arrived at quite readily. The official was at work on such a compound which had to be declared for the German custom houses.

It is also very interesting to notice the excellent method of giving an accurate estimate of the composition of a top as regards length of fiber. A German machine made by Schlumberger is employed, and this is fitted with a set of fallers which operate much in the same manner as a combing machine. As a result the various lengths of fiber present in the top can be ascertained and the same are mounted on a card along with the percentage of fiber of the different lengths, results which are exhibited very effectively on a black card.

Extremely interesting was the microscopic department, which aims at solving the problems of the abnormal fiber. Under the microscope at the time of our visit was a sample of yarn taken from a cloth which had exhibited great weakness when finished. Fibers had been extracted and mounted under the microscope and the cause of the defective strength could be plainly seen on the fiber. It had evidently been attacked by some organism, for the scales were falling off in considerable quantities. The official was also engaged in finding out if skin wool was present in a cloth, and had secured some fibers showing conclusively that this was so, as the sharp-pointed ends of the roots were plainly discernable. Evidence was also given in another cloth of the presence of milldew on the fiber. Results of this kind to be reliable require to be carried out by one who has had considerable experience with the working of a microscope and requires patience and the examination of a number of samples before arriving at a definite conclusion. The fibers should, as far as possible, be exmained on the same microscope, because on new unfamiliar instruments, one is rather apt to construe certain light and shade into peculiarities of fiber when it is merely a phase in the lighting up of the specimen. In this department a record is kept of the leading typical fibers with which new samples are compared with a view to classification. It is one of the important principles of the establishment that a record of all work is kept, and they are always gaining added experience which is directed to making the institution more valuable to the trade.

Strength-Testing Machines.

In this section also they have a single thread testing machine for giving the strength of single yarns and a demonstration was given on the well-known machine made by Schopper, of Leipzig. The single thread machine, which is

coming into favor in Great Britain, is that made by Bayer, of Zurich, Switzerland, but for precision and smooth working, it is surpassed by the Schopper. The conditioning house takes 20 tests of all the samples submitted to them, but this business in this section is very limited.

During our visit, a fair amount of work was proceeding in the chemical department. All around were lying patterns of cloth which had been sent in by manufacturers to have the percentage composition of wool, cotton and other fibers determined. All around were evidences of the destruction which had been done by caustic soda on a wool and cotton mixture, and in some cases the cotton residue of warp and weft was shown as a skeleton cloth. They were also engaged in obtaining the percentage of insoluble bodies in wool and other materials by the ether process.

CHEMICAL LABORATORY.

What has just been described refers more particularly to the general method adopted by the conditioning house at Bradford, and the bulk of the business done in conditioning worsted tops. With special reference to the knitted goods trade, the conditioning of the tops has a very direct reference to knitted yarns, which in Bradford are made in great quantities. In the conditioning ovens we found some knitted fabrics being conditioned for moisture in the same way as for tops, yarns and other materials. There was also some samples of knitted goods white waste which was being conditioned prior to being sold to the shoddy merchant.

As is well known, knitted goods form a very important class of re-manufactured articles, especially if the goods have not been previously milled. Fine merino yarns made of a mixture of cotton and fine wool, are also much sought after. Those who buy such materials know the value of having a correct estimate of the exact moisture present at the time of the sale, and the goods are frequently sent to the conditioning house for this purpose. The center which deals more particularly with knitted fabrics is at Nottingham, England. In the future as competition in the knitting industry becomes keener, more attention will be given to the conditioning of the materials from which they are made. This is particularly the case when we consider that knitted fabrics are sold by the weight per dozen garments, and it is one of the great troubles of the manufacturer to get them up to the correct weight. Put them in a damp store and the weight of the lot will appreciably increase, and in placing them in a warmer room, the weight will just as appreciably decrease. In the trade it is well known that articles rejected for being rather light in weight may be placed in a moister atmosphere or repacked so as to give them more moisture, and the same articles sent and returned are frequently accepted.

In Manchester, England's great seat of the cotton industry, we find that more and more attention is being given to conditioning the materials. It cannot be said that the custom of conditioning is so prevalent there as in the worsted industry, because the custom of selling on condition has not been so generally recognized. The work of the conditioning house, formerly spread over several private agencies is now under the control of the Manchester Chamber of Commerce, and certificates are issued with the full official authority of the chamber behind them. Manchester, however, differs from Bradford in this important respect, and that is they do not lay themselves out for storing considerable quantities of material, and so the establishment is not nearly so large as that at Bradford. When the method is explained, however, it will be seen that the work is none the less thorough. On receiving notice from the manufacturer, an officer of the conditioning establishment is sent off to take samples of the lot to be tested. These are drawn by him in the most approved fashion so as to give a fair representation of the bulk, and the samples placed securely in air-tight tins, kept for the purpose.

The Manchester institution was very much hampered in its work by finding that the records of their strength tests on yarns and cloths were frequently upset by the

TEXTILE TESTING LABORATORY AND THE AIR CONDITIONING APPARATUS.

varying conditions of the moisture of the atmosphere. A party would send in a sample to test for strength, and a short time afterwards would send in the same lot to be tested. When finished, it was frequently found that the two certificates were different in their results so as to cast grave doubt on the methods employed. The present manager of the institution, Mr. Barwick, gave special attention to the matter and worked out a series of experiments on the influence of moisture on the chief textile materials. Whilst his methods of procedure are open to some criticism from the point of view of the pure scientist and his methods, yet the results of his tests are very decided and give a good idea of the influence which may be exerted by moisture in varying quantities. It will be sufficient to consider the results obtained from the three materials, wool, cotton and flax. In the case of wool the experiments showed that the

strength decreases as the amount of moisture increases. That is, a woolen cloth on a dry day is stronger than on a damp day. In the case of cotton and flax the reverse is the case, for we find that the strength increases as the amount of moisture increases. The increase of strength is greater in the case of flax than cotton. In the case of wool, the difference between the driest test made and that of the dampest day, the strength was shown to vary some 18 per cent. That is, the cloth was found to be 18 per cent weaker at the time when the atmosphere showed the greatest amount of moisture as compared with the test made when the moisture was at the minimum. In the case of the cotton cloth, there was shown an approximate increase of 14 per cent in strength on the test giving the greatest amount of moisture as compared with that which showed the least moisture. For flax material the increase in strength under the same conditions was 20 per cent.

From what has been said regarding the influence of moisture on the strength of cloths, it will be readily understood that its influence on the counts will be equally marked, the counts becoming coarser in direct ratio to the increase of moisture present.

To estimate the importance of what has been said regarding moisture, it should be understood that the Manchester testing house has a considerable amount of work in the direction of testing the fabrics supplied by English manufacturers to foreign governments, such as Egypt, Japan, etc. The government places the order with the firm sending at the same time a copy of the specifications to the testing house and empowering them to see that the goods supplied are up to the sample in every respect. To carry this out in a satisfactory manner, all tests of strength and counts are carried out under uniform conditions of moisture. To obtain these conditions special machinery was necessary. The apparatus installed is an American invention and supplied by the Carrier Air Conditioning Company, of New York. By its use the moisture can be kept regular, no matter if the moisture present in the atmosphere is less than the normal, as the apparatus can be set to work and in a few minutes the room can be brought to the condition required to carry out the tests. By means of this apparatus temperature may also be maintained at a certain specified point, if it be desirable to do so.

In the accompanying illustrations we have given the apparatus in general use in all conditioning houses in Great Britain and on the Continent of Europe, and the views are from the Manchester testing house. In the illustration is given a view of the equipment of conditioning ovens used, and they are of the usual construction. In Bradford they are heated by hot air, which is sent through from a central heating apparatus. The whole of the heat, however, is not supplied from the central stove, but only up to a certain temperature. The extra temperature which is required to dry the sample completely is given by the row of bunsen burners which are placed at the bottom of the oven. In this way the exact temperature may be regulated to a nicety so as to prevent scorching the sample. The usual weight of the sample is rather less in the case of cotton than of wool, and cotton is generally tested in lots of one-half pound. When the creel or basket is hung onto the inside arm of the balance placed above the oven, the arm is exactly balanced. At the start of the conditioning operation, weights equal to the sample are placed on the right arm and the heat applied. As the sample dries, weights are taken off the right hand scale pan and when all the moisture is evaporated, the scale remains steady. The greatest care is taken to see that this is reached before the final reading is taken. To insure all the moisture being evaporated the temperature must reach at least 212 degrees, F. If the heat exceeds that point, there is considerable risk of the material being scorched and the whole reading in that way vitiated.

In Manchester and Bradford much attention is now being given to the oven which is heated by electricity, and it is probable that the heat will in the near future be supplied in this way. Manchester already tests most of its materials by the use of this type of oven.

For the final result the percentage of moisture present in the sample is arrived at by comparing the original weight of the sample with the dry weight, and then calculating the percentage of loss. This, in the trade, is termed direct loss percent, and if more than the normal percentage is present the buyer may claim compensation from the spinner. In connection with this figure, however, we also must give the standard regain, that is, the percentage which the dried sample will take in again when left open to the atmosphere. In Great Britain the standard percentages fixed on for the various materials are as follows:

Material.	Regain, Per Cent.
Wools and waste	16
Tops combed with oil	19
Tops combed without oil	18¼
Noils	14
Worsted yarns	18¼
Cotton yarns	8½
Silk yarns	11
Flax and Hemp	12

When the results have been arrived at and all the calculations checked, the final stage is to incorporate the results in a certificate or printed form which is sent to the customer duly signed and giving details of the figures for his perusal.

France seems to have taken the lead in the matter of conditioning, and there are no fewer than six establishments in that country. In Belgium the chief town is Verviers; in Germany, Elberfeld, and Leipzig, and in Austria, Biella. The most recent institution of this kind in Great Britain is in Belfast, Ireland. Until about three years ago anything in this line was done by private parties in Belfast, but the matter is now run by a committee in connection with the Municipal Technical Institute. In Great Britain, everything points to the custom of testing and conditioning becoming more common with the increase of competition.

During the first three months of 1913 there were 1,982 bales of cotton, or 766,640 pounds, valued at $97,501, exported from Southern Nigeria, West Africa, against 971 bales, or 381,808 pounds, valued at $37,529, during the first three months in 1912. The local price obtained for this cotton ranged from 9 to 13 cents per pound. Though this is an increase over previous years, and the prospects, as stated recently by the president of the British Cotton Growing Association, are that West Africa will produce a crop this year of quite 20,000 bales, the tendency is toward no large production for export from West Africa during the near future, the production per acre being too small, averaging not over 200 pounds. The climatic conditions—the long dry spells and the long wet spells—are against the growth of cotton on a large scale.

DYEING, BLEACHING AND FINISHING.

THE MANUFACTURE OF ARTIFICIAL SILK FROM COTTON.

(*Contributed Exclusively to* COTTON)

BY H. R. CARTER.

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MAKING THE SOLUTION.

In dissolving the cellulose in ammoniacal copper oxide solution, the best proportion between the copper and the cellulose is that between one molecular weight of the cellulose, $C_6 H_{10} O_5$, and one atomic weight of copper. The cellulose dissolves much more easily if it has been first treated with strong caustic soda.

Artificial silk solution may be prepared by dissolving cellulose in an ammoniacal solution of cupric carbonate. An aqueous solution containing 16 to 18 per cent of ammonia is saturated in the cold with cupric carbonate and the cellulose is dissolved in this liquid. Solutions of cellulose prepared in this way have the advantage that they contain more copper than corresponds with the molecular proportion which is precipitated when cupric hydroxide is employed. Further, since salts of copper, like cupric carbonate, have no oxidising action on cellulose, solutions of the latter in ammoniacal cupric carbonate are more stable than solutions of cellulose in ammoniacal cupric hydroxide. Thus, even after a long time, neither is the ammonia oxidized to nitrous acid, nor the cellulose to oxycellulose.

A different method of preparing cupra-ammonia as a cellulose solvent from that already described consists of copper producing a green precipitate, which should be first washed in water and then mixed with ammonia. A clear blue solvent is then formed which can be decanted off for use and the precipitate treated with more ammonia.

In the manufacture of cellulose solution under the viscose process, the first thing to be done is to mercerize the cellulose. The cellulose or wood pulp is well beaten in a hollander and pressed to cakes containing 50 per cent of moisture. These cakes are then broken up, put into an edge runner and ground up, a strong caustic soda solution being added. A chemical compound known as alkali cellulose is thus formed. This mercerized product is stored at low temperatures in hermetically sealed jars. When sufficiently mature it is transferred to the mixers and mixed with the necessary quantity of carbon bisulphide, *i. e.*, 75 pounds to each 100 pounds of cellulose, the whole being kept at a low temperature. The alkali cellulose and bisulphite interact producing the sodium salt of kanthogenic acid or a solution of sodium cellulose kanthogenite or cellulose thiocarbonate. The fibrous and spongy alkali cellulose gradually changes to a bright yellow sticky mass which when stirred with the addition of water, produces a solution of cellulose thiocarbonate or viscose of a thick gummy consistency. This viscose solution decomposes gradually under the action of light. The solution therefore (which is a 10 per cent one) should be kept in hermetically sealed vessels in a cool place and the solution quickly used. Carbon bisulphide being extremely inflammable great care must be taken towards the end of the process, as the superfluous carbon bisulphide evaporates.

When the viscose solution is heated for about an hour, viscride, a solid horny substance is formed. Viscride is used in the manufacture of buttons, handles, etc.

Another method of preparing viscose solution is as follows: 100 pounds of white wood pulp are covered with an aqueous solution of caustic soda containing about 18 per cent of the caustic. The pulp is allowed to soak in this solution for about 24 hours and then pressed through the filter press, which while removing the excess of solution, leaves about 200 per cent by weight of moisture in the mixture. The material is then stored in closed vessels for 48 hours, or so that the alkaline solution may thoroughly permeate the cellulose. It is then placed in a closed vessel or mixer with 75 pounds of bisulphide of carbon and stirred until the reaction is complete, say in about 5 hours. The plastic mass is then exposed to the air for a short time to allow the excess of bisulphide of carbon to evaporate. Soda lye consisting of 52 pounds of caustic soda and 300 pounds of water is then added and the mass stirred until a homogenous solution is obtained. This viscose is now easily soluble in water, brine, soda lye or weak acids, but eventually by decomposition becomes insoluble in all except soda lye of proper strength. By the neutralization of this excess of caustic soda, the material can be easily precipitated into a gelatinous mass.

In the manufacture of artificial silk from viscose, the latter is maintained in solution in the presence of excess of caustic soda and stored in closed vessels. The solution matures or ages in about 7 days at a normal temperature of 60 degrees F. The viscosity of the solution is changed by the addition of an 8 per cent caustic lye. The usual solution contains 6 per cent of cellulose.

In the manufacture of artificial horse-hair from cellulose solution, the cellulose should first be converted into hydrocellulose by heating for half an hour with hydrochloric acid of 12 degrees Tw. The material is then washed, hydro-extracted and dried and is then dissolved in a zinc chloride solution at 176 degrees Tw. A 20 per cent solution of cellulose is thus obtained.

Another method of making a solution of cellulose in zinc chloride consists in adding carbonate of zinc to a solution of chloride of zinc so as to render it neutral, filtering the liquid and concentrating it by evaporation to a density of at least 1.8. The cellulose is then added to this solution which is kept at 212 degrees F. until a thin solution is obtained.

All these solutions in whatever way obtained should be thoroughly strained or filtered in their passage from the mixer to the storage vessel. The enclosure of air in the solution should be most carefully avoided and minute air bubbles removed by stirring under vacuum. Air bubbles are most troublesome in the spinning hence every care should be taken to eliminate them.

(*To be Continued*).

"Courtesy and affability do not require one to be a sychophant, nor to do or practice anything humiliating or repulsive to one of gentlemanly instincts. Ordinary discretion teaches the right methods."

Consult with your master mechanic; that is what you pay him for.

NOTES ON DYEING, BLEACHING AND FINISHING.

The Newest and Latest Chemical Facts From the Laboratories of the World. Prepared for and Contributed Exclusively to "Cotton."

By J. Merritt Matthews, Ph. D.

Marine Fiber.

This is a new sort of fiber which is obtained by dredging from the shallow seas of a gulf in South Australia, and it is said it can be put on the London market at a price of about $25.00 per ton. Chemically it seems to be a hydrated lignocellulose giving the typical reactions of lignin and microscopicaly it is strongly similar to that of New Zealand Flax fiber. From these facts it is certain that the fiber is not of marine origin, but is produced by the natural retting of a land plant which has been submerged to the bottom of the sea. On account of its lignified character the behavior of the fiber towards dyestuffs is peculiar. It can easily be dyed with basic dyestuffs without a mordant and gives fairly good results with some acid dyestuffs which have residual basic properties. For salt and sulphur colors it has very little affinity, and for ordinary acid dyestuffs none at all. The fiber is brittle and not very strong.

Production of Resist Effects in Printing.

Resist effects are obtained by first printing the bleached material with a resist paste consisting of a suitably thickened leukotrope and subsequently applying to the printed fabric by padding, printing or any other suitably known methods, a color mixture containing a suitable vat dyestuff together with such assistants as are commonly used for the fixation of these colors. The fabric so treated is then steamed and finally submitted to the usual after-treatment. In order to obtain color resist effects, suitable mordants, metallic oxides or coloring matters may be added to the resist paste. Or, as a modification of the process, the material previously prepared with an alkaline beta-naphthol solution is printed with a leukotrope resist paste to which has been added a suitable diazo solution and is then treated with a color mixture containing a vat dyestuff. The term "leukotrope" is used to designate certain organic quarternary alkaryl-ammonium compounds amongst which may be specified dimethyl-phenyl-benzyl-ammonium chloride sold as leukotrop or discharge paste No. 1, and dimethyl-phenyl-benzyl-ammonium-hydroxide,disulphonate of soda known as Leukotrop W, or indigo paste W. Several recipes are given for the preparation of this paste and color mixtures which give good results in practice. The foregoing is contained in an English Patent No. 16389, July 9, 1910, which has recently appeared and was taken out by the Calico Printers' Association.

The Use of Vat Dyestuffs in Calico Printing.

Printing with vat dyestuffs has recently been subject to much discussion, and stress is laid on the important part played by the thickening agents, in the selection of which regard must be duly laid not merely on its behavior to the alkaline hydroxide employed in using the vat dyestuffs, but also on their properties from a colloidal chemical standpoint. In the case of British gum it is pointed out that the thickening is not liquified on steaming by the relatively large proportion of sodium hydroxide in the color base, but that it is converted into its homogeneous modifications and remains in that condition. This gives like all homogeneous colloidal thickenings a good penetration into the fiber without, however, properly binding the leuco derivatives of the dyestuffs; free oxidation takes place so rapidly that a portion of the color remains unfixed. Starch thickening, a micella solution, is also converted into the homogeneous modification in the steaming of the color paste, but on cooling it reverts to the original micella solution condition, which insures a good, thick solution of the leuco compound, and its slower reoxidation resulting in a well-fixed color. For those dyestuffs derived from anthraquinone which yield difficultly soluble leuco compounds, a mixture of British gum and wheat starch should be used, the proportion of starch being increased or diminished as the leuco compound is more or less soluble.

A New Test for Oxycellulose and Hydrocellulose.

Ermen has recently followed up a suggestion of Knecht and has worked out the following improvement of Scholl's test for altered celluloses. A few drops of suspension of indanthrene yellow, (prepared by dissolving some of the dried paste in strong sulphuric acid, precipitating by pouring into cold water and neutralizing the liquor) are added to a 10 per cent solution of caustic soda and the cloth to be tested is passed through the mixture and slightly squeezed. The material is then held over a beaker in which water is vigorously boiling. Within a minute a deep blue stain appears wherever oxycellulose or hydrocellulose has been formed while the rest of the cloth, if it has been carefully bleached, shows no trace of blue for at least five minutes. If the cotton is next washed, soured and rubbed with soap, the unaffected dyestuff is readily removed, but where the reaction has taken place the color is firmly fixed.

The Printing of Naphthol Colors on Unprepared Cloth.

The solution of the problem of abolishing the necessity of preparing cotton cloth with naphthol, which is the weakest feature of the present process for producing the so-called ice colors or naphthol colors, calls for the co-existence of the diazo and phenol components in one fluid medium. The mixture must be reasonably stable and capable of being applied without damaging the fibre. The present method suggests that the problem may be solved by applying either or both of the components in an inert form. Beta-naphthol, for example, becomes inert whenever the first position adjoining the hydroxyl group is occupied; and provided that the substitution group is loosely bound, any compound of this class may be suitable. The only inert diazo compounds which have been found practical are the nitrosamines, and most of those nitrosamines derived from diazo compounds used for producing ice colors are too unstable for commercial application. Diazo sulphonates, however, are quite stable, and several of them can be converted into diazo compounds, (presumably sulphate) by oxidation.

Action of Bleaching Agents on the Coloring Matter of Linen.

The coloring matter of unbleached linen is practically unaffected by a solution of pure hypochlorous acid and by free chlorine. But if a small quantity of any alkali be added to the solution they both bleach the linen. The addition of common salt to a solution of chlorine in dilute caustic soda with a view of reverting the action leading to the formation of sodium chloride, sodium hypochlorite

and water, has generally much less effect on the bleaching of linen than on the bleaching of other coloring matters with which experiments have been made.

Behavior of Cotton Cellulose With Dilute Solutions of Metallic Salts.

Cotton cellulose is capable of absorbing and fixing small quantities of copper from dilute solutions of copper salts. Approximately the equivalent quantity of free acid remains in the solution; the absorbed copper cannot be removed by washing. Unbleached cotton absorbs more copper than bleached cotton. If the cotton be thoroughly purified, chiefly by means of caustic soda solutions and hot water, its capacity for absorbing copper is reduced to a minimum. The very slight absorptive power still retained is probably due to oxycellulose. Cellulose hydrate and hydrocellulose do not absorb copper from solutions of the salt. It is suggested that the copper sulphate value determined as in the manner indicated above would prove a valuable adjunct to Schwalbe copper value for distinguishing different kinds of celluloses. No absorption of copper salt, that is to say, the sulphate and acetate, as such from dilute aqueous solutions by cotton could be detected. Analagous results to those obtained with copper sulphate solutions are given by solutions of nickel sulphate, aluminum sulphate, and potassium chloride with carefully bleached and purified cotton. Artificial silk including those of the cupra-ammonium and viscose variety fix a larger quantity of metal than cotton does. The absorption of the metal is independent of the concentration of the solution, the temperature and the time of contact. Silver nitrate is reduced by the different kinds of cellulose, and the amount of silver fixed increases with the concentration of the solution. Basic dyestuffs behave in a similar manner to metallic salts; a small but distinctly recognizable quantity is fixed in such a form that it cannot be removed by washing.

Pigment Colors Obtained With Metallic Salts on Cotton.

Ferric oxide is usually fixed on the cotton fiber by first working the material in a solution of a ferric salt, and then in a dilute solution of sodium carbonate. A less reddish shade can be dyed in the following manner: A solution of a ferrous salt is obtained by dissolving 145 lbs. of ferrous sulphate, 50 lbs. of crude lead acetate (prepared from pyrolignious acid) and 5 lbs. of alum in 65 gallons of boiling water and then gradually adding a solution of 5 lbs. of sodium carbonate. After standing, the supernatent liquor is decanted off and the residual precipitate is washed with 12 gallons of boiling water, which is afterwards added to the main solution together with enough water to produce the required degree of dilution. The material to be dyed is first padded two ends in clear lime water and then two ends in the ferrous solution. Before the final washing off the batch of cloth is allowed to stand for about an hour so that the greenish ferros hydroxide can be oxidized by air to the ferric compound which is of a buff shade. To obtain the Khaki shade demanded by the French War office, the material is padded in a mixture of a solution of iron acetate and chromium formate and dried in a hot flue and steamed. In order to improve the handle of the fabric it is next treated with a boiling solution of sodium silicate containing chalk in suspension and is then washed.

Some New Solvents for Cellulose.

Cellulose in the form of filter paper is soluble in concentrated aqueous solutions of certain salts such as antimony trichloride, stannous chloride and zinc bromide. In solution in aqueous hydrogen chloride or hydrogen bromide these salts, and many others, dissolve cellulose with great ease, also a few salts of formic acid, and trichloracetic acid. It is probable that the process of solution is due to an attraction of cellulose for the metallic salts which varies in magnitude with the degree of hydration and the mechanical structure of the cellulose. This attraction results in a division of the salts between the fiber and the solution. The absorption medium may now either become hydrated or pass into solution. The latter effect is only likely where a high temperature is employed or where some agent, for instance an acid is present which can bring about union with water. In support of this view it is found that cellulose modified by treatment with acid becomes soluble in certain reagents, for instance, a solution of calcium chloride in which it was previously insoluble. Chlorsulphonic, arsenic and selenic acid have also the power to dissolving cellulose. From the acid solutions of salts in which cellulose has been dissolved, there are obtained by re-precipitation amorphous products which have marked reducing properties and are readily hydrolyzed. These products are modified celluloses. One of the formates of cellulose has been hydrolyzed by concentrated hydrogen chloride giving a similar modified cellulose. Further action of the hydrogen chloride converts the cellulose into products soluble in water and finally into dextrose.

Discharging of Indigo by Use of Chlorates, Nitrates and Bromates.

In order to protect the indigo grounds and the fiber itself from being affected by the oxides of chlorine liberated during the steaming of chlorate discharge prints on deep indigo bottoms, Tagliani in a recent communication to the Industrial Society of Mulhause, proposes to pass such fabrics before printing into a solution of size to which glycerine has been added. He suggests that these substances being hygroscopic, cover the fiber with a thin layer of moisture, which acts as a protective against the corrosive vapors contained in the steamer. Noelting in a report on this note states that although the process is novel it does not give very satisfactory results when tried on a small scale. Possibly, however, on a larger scale it would work better.

ERRATA.

In the article, "The Development of the New Indigo Discharge Process by the Use of Nitrates and Nitrites," on page 445 of the September issue the following corrections should be noted:

In envelope 2, 11th line, instead of one to five parts water, it should be 1.5 parts water.

First column page 446, third line from the bottom, substitute printing for painting.

Second column, page 446, fourth line from the top, insert and after soda.

On page 447, fifth line from the end, substitute later for latter.

The Burma cotton acreage for 1912-13 is 219,988 acres, or 35,085 more than last season. Consul Moorhead says the crop estimate is 43,500 bales of 400 pounds each.

Remember the San Diego exposition will be the most unique and interesting ever held; 1915, all the year.

Practical Problems Discussed by Cotton's Readers

We invite our readers to make use of this department for the discussion of any and all problems arising in the mill or the finishing plant. Questions, answers or letters need not conform to any particular style and will be properly edited before publishing. The editors do not hold themselves responsible for any statements of opinion or fact which may appear in this department unless so indorsed. This department is open to all.

A BEAMING PROBLEM.

Editor Cotton:

I have been very much interested in a number of articles appearing in Cotton from time to time and particularly in those pertaining to beaming. In this connection I would like to ask your readers about how long it should take a beamer to beam a warp with 5,164 ends, 775 yards long, of 26/1's, free from breaks and snarls, doubled and sized. Especially would I be glad to hear from J. W. Kirkwood, who contributed an article on beaming to the April, 1913, issue. He described the Yorkshire beaming system and I would appreciate having him tell us how long it would take to beam this warp by that system.

M. W. (Pennsylvania.)

A QUESTION FOR CARDERS.

Editor Cotton:

Did any readers of this department, especially carders, ever notice how some ends will run over on the slubber and intermediate? What I mean is, that at the completion of the traverse one end will run over, then perhaps the frame will run for a couple of layers and another end will run over. When a few ends run over we know the trouble is either in the rack getting stuck or the builder being out of order, but what causes only one end at a time to run over? No doubt many readers of this department have experienced this trouble, but what is the remedy?

I know a remedy, but I want to get the opinion of some other readers before giving same. My only object in contributing to this department is to exchange what practical knowledge I have for other knowledge which I have not.

Wash. (New York.)

KEEPING THE FLATS CLEAN.

Editor Cotton:

I noticed in one of the recent issues of Cotton that one of your subscribers asks how to prevent the flats on a card from filling up, and, in a later paper he is told by another subscriber to reverse the brush. Now in my experience, to reverse the brush is the worst thing that can be done. To be sure it will clean the flats out, but it ruins the brush by splitting the bristles, so that it weakens them so much that they will never be able to keep the flats clean when running in the proper direction.

Also a burnishing brush is not worth while either, except when a card gets wet or damp, which may cause the wire to rust, then the burnishing brush comes in handy, but with me, I have not used a burnisher in over ten years.

About ten years ago I had trouble with my flats filling up and used to spend hours with a wire knife picking the cotton out of them, until finally I began to look for a permanent cure which was *not* the wire knife. After studying over the situation I discovered that the brush on the front was not doing its work and on examination found that the bristles were split in the ends and did not have the strength to reach the bottom of the wire, so I took one off and carried it down to the fireroom, where I put the ends of the shaft on two small horses, then I got a piece of wrought iron about four by three inches and put it in the fire and got it red hot and then by the aid of a large pair of tongs I just lightly seared the ends of the bristles, turning the brush so as to draw the iron the full length of the row. This I found to be the best remedy for flats filling up and after burning every brush in the room I found that the tops were kept clean all the time without any further trouble. To be sure, I nearly killed the firemen with the smell of burnt hair, but they had to stand it as well as myself.

W. B. W. (Mass.)

FACTS ABOUT TWISTERS AND SPINNING FRAMES.

Editor Cotton:

There are a few things about twisters that some overseers overlook for the purpose of getting a big production of yarn at the end of the week. One is about the yarn that they put on the frames to be twisted with little or hardly any twist in it from the spinning frame. In case they were to insert enough twist in this yarn so as not to break half as much as some of these yarns do, the spinning production at the end of the week would be low, or not enough to satisfy the superintendent and he, too, would make a fuss. Furthermore, taking two teeth from the twist gear, or in other words, a gear with two teeth less than the one running on the spinning frame at present, would help a great deal in the making of a good strong yarn, which would not break so much on the twisting machines, as it would with a gear of two teeth more, especially in the case of poor and uneven yarn.

About a big production, I might say that adding a tooth or two to the spinning frame twist gears, it would, of course, through suitable gearing, make the draft gear go a little faster, which in turn would make the back or feed-roll feed more roving. Also, the front-roll gear which drives the front-roll, would deliver the yarn just a little faster. The front-roll gear receives motion from the twist gear through another larger gear. Although two teeth does not seem much to certain overseers, it affects the yarn a lot and the help are the ones that get their share of the hard work; I mean that the frames run bad, for they are constantly breaking back. Now two teeth on coarse yarn would, at the end of the week, make a big production for this certain kind of yarn.

Adding two or three teeth to the twist gear helps in putting out a lot of yarn, also taking a few inches from the pulley or a smaller pulley helps a good deal at the end of the week. As soon as this certain kind of yarn, and all other yarns run under the same conditions arrive at the twisting machines, why it is impossible to keep the frame running straight. They often change the pulley for a big production on twisters, for that makes the cylinder go faster, which in turn makes the jack-gear, through the cylinder

gear go a little faster. Then the jack-gear makes the twist-gear also go faster, and that, through a large gear, makes the front-roll gear run faster; the result is that the yarn is delivered to the bobbin just a little faster. There is a remedy for all of these points, but it would, of course, result in a smaller production, and that is not the thing talked about in our days.

However, I find that the most important point in the twister room is overlooked by most overseers, and that is they fail to instruct the twister room boys to make the piecings as close to the roll as possible. When you make your piecing at a distance from the rolls, a certain amount of twist is lost, hence a weak place in the ply yarn.

Lewis. (Massachusetts.)

THE "KNOW-IT-ALL."

EDITOR COTTON:

Unfortunately there are many men in business who think that they know all there is to be known about the business that they are in and consequently do the company with which they are connected much harm. Usually the one who does know a great deal is the one who realizes that there is more which he does not know than that he does know. Such people realize that while they may know the essential points, all lines are constantly improving and progressing and therefore it is necessary to keep learning new things to keep abreast of the times. The great trouble with the fellow who thinks he knows enough is that he makes no attempt to learn the new things, so that, while he may know much, his knowledge is behind the times and he is going to lose out.

This impression was given me by a superintendent of my acquaintance a short time ago. He was telling, (due to his long experience in such plants), how well the plant was running and how economically. While this was no doubt true I will venture to say that if he had not been so satisfied with his knowledge of the business as it was conducted ten years before, he would have been able to easily see that some of his machinery if replaced by a more modern style, would have increased the production. He is one of those people who are never interested in what his competitors are doing. He looks after his own plant and has no sympathy with new-fangled ideas as he designates everything that was not in use some years ago. I do not suppose that he has ever been in a plant of a competitor to see if they have any system that would be of benefit to his plant if put into operation there. He says that none ever come to him therefore he goes to none of them. This however is easily explained as the others only go to see live plants where there is something to be learned and as he is a "dead one" they do not bother about him. He is invariably courteous to all salesmen, but if their machinery is worked out on any new prinicple he is not interested. Now, please understand me, he is a good man and able to run a profitable business, but he has the impression that he learned enough years ago and consequently his knowledge cannot be improved. If only he would get over that and realize that the line is progressing and that he is out of date his success would be double. He works twice as hard to accomplish results as another man would do with the same size plant who uses the newer methods.

I may have the wrong impression, but when an executive applies to me for a position and presents lots of references I put him down as a "Know-it-all." I may have been unfortunate but a majority of the references presented to me have been such that they looked to me as though the writer either was afraid to tell the truth for fear of a libel suit or gave the reference letter for friendship's sake. This belief of mine was strengthened lately by an experience I had with a young fellow who came to me for a position as overseer. After asking him the usual questions I inquired (from force of habit) whether he had any references. He said: "I never carry references. I will give you the names of the people I have worked for and you can write them. In the mean time put me to work and let my work be my reference. While I know something about the work I still have much to learn as there are always new things coming up and I am mighty willing to try and learn both new and old." I put him to work six months ago and have not written to inquire about him yet. He is the best man in our plant.

W. J. B. (Ohio.)

THE SCARCITY OF SPINNING ROOM HELP AND THE REASON.

EDITOR COTTON:

In the section of New England in which I work almost every mill is short of ring spinners, and one mill will often bring pressure to bear to compel the help to come from another. Where a mill is running independently, without operatives' houses, and depending upon the surrounding communities for its help it is often confronted with this situation; operatives are employed who have family connections working in another mill owning operatives' houses, in which the family lives. The mill owning its own houses also becomes short of help and word is sent to the heads of such families as live in its houses, and have members that are working in other mills, that unless they come to work in the mill which owns their house, they must vacate the tenement. This seldom fails to bring the desired result. It also makes it almost imperative that each mill own enough homes to house its own help, and that everything reasonable be done to make the family life most comfortable and enjoyable.

Sometimes certain inducements are held out in the line of better tenements, or superior running work. I know of a mill which has superior factory tenements and is known in the community for its inferior running work, but it is seldom short of help, and draws help from surrounding mills where the running of the work is superior but the tenements are inferior; which shows that living conditions has a tendency to outweigh working conditions in the mind of the operative. Where a mill has superior tenements and superior running work its position is unassailable and it is seldom or never short of help.

Another thing manufacturers should pay more attention to is the conditions governing their spinning. Before the Northrop loom became so common, and bobbin filling so popular, there were employed in many mills mule spinners. These were men almost invariably, and they had families of from two to six workers, some of whom were employed in the spinning room to increase the family wage. They earned from two to six dollars a week, according to age and ability. With the discarding of the mules and the substitution of the ring filling frames, a class of help was called into action which is in many cases free from family connections

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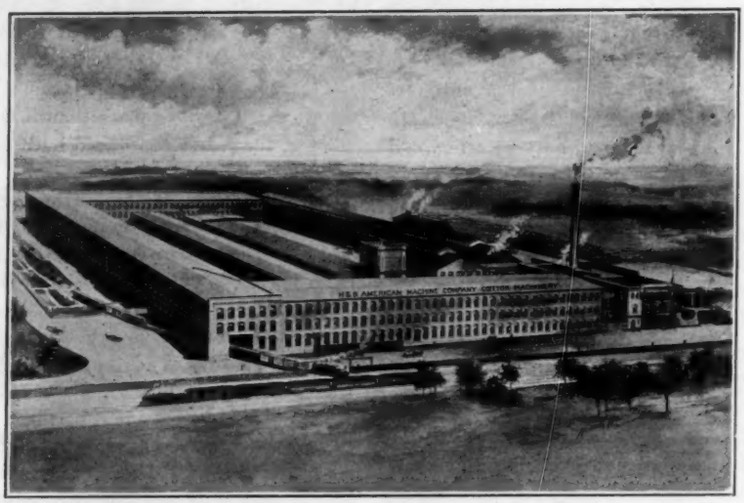

Spinning Room Machinery

Twisters for Wet or Dry Work

With Band or Tape Drive

H. & B. AMERICAN MACHINE COMPANY

PAWTUCKET, R. I.

in the mill. Mills cannot employ weavers with enough family help to run their spinning, because where a mill of 400 common looms would employ from 50 to 55 weavers, 400 Northrop looms will give employment to only 20 or 25. This lessens the number of families employed and causes a shortage of small help. The mill must be recruited by boys and girls living in the community who are desirous of earning money. Many of these get discouraged and leave, going from one job to another, and it almost impossible to bring any pressure to bear upon them, on account of having no family connections in the mill. It is an evil which must be met, because every hand lost represents a loss to the mill by money spent for learning, and the inferior work made.

The average wages paid in a spinning room ought to equal the average wages paid in the weaving or carding rooms, and the jobs should be made just as desirable. I know of three families employed by a certain corporation, who have seven girls among them, old and strong enough to work. These girls are waiting for positions in the weaving or carding rooms. The overseer of the spinning room has offered them work, but their parents refuse to let them go into the spinning room, saying, "the work is too hard and the pay is too small, and once a spinner always a spinner, with spinners' wages." Each family stands ready to move and seek employment elsewhere if pressed to place these girls in the spinning room.

The tendency at present is to run the spinning too fast, thus reducing the number of sides which a spinner can run, consequently causing low wages. I know of no more discouraging work in a mill than to have the spinning running in such a condition that the spinner never sees all of the ends up from morning to night. Many times a tooth of twist in the carding room will work wonders in improving the work in the spinning room, but unless the boss carder has the welfare of the other rooms at heart, as well as his own room, it is almost impossible to get it, for he will claim it is unnecessary, as his work is running all right, and it lessens his production, increases his cost, and lessens his speeder tender's pay. If the conditions in the spinning room are made desirable both in regard to the running of the work and wages, and the tenements well looked after, I do not think that there would be the shortage of small help that certain manufacturers are now experiencing.

F. S. T. (Rhode Island).

TO REMEDY BADLY BUILT BOBBINS.

Editor Cotton:

There is nothing that gives the card room or spinning room such a bad appearance as that of badly built bobbins. You will find the trouble known as running over and under in almost every cotton mill. You will also find in the mills where this trouble exists the English type of builders on the fly frames.

The chief trouble is that in a short time the latches and builder rocker become smooth and the latch slips out before the carriage has completed its upward or downward traverse.

The proper way to remedy this trouble is to take the builder out and square the latches to the rocker by filing. This method means a loss in production, and for this reason is often neglected.

I would like every carder to try the following to remedy running over and under. At doffing time, give the rocker

and latches a good rubbing with emery cloth. You will be surprised at the improvement this will make in the build of the bobbins. Let your Uncle "Wash" know about it.

Wash. (New York.)

WHICH IS THE MOST TROUBLE?

Editor Cotton:

In the August issue of Cotton "X. Y. Z. A." asks the question, "Which is the most trouble in a Cotton Mill—The Weather, the Cotton or the Condition of the Mill?"

In answer, I would say the condition of the mill, yet this question is one that requires a lot of thought which, to be fully appreciated and answered should only be attempted by those who have had years of practical experience under such trying conditions as one can only gain by working in different mills where he can come in direct contact with several varieties of conditions. In a modern up-to-date cotton mill on 30's to 40's yarn these conditions do not give one very much trouble for these three vital points are gererally considered in the construction of the plant, the installation of new and modern equipment and the purchase of a grade and quality of cotton suitable for the numbers that are intended to be spun, etc. Yet there are plants in operation where all these questions were not given this consideration and one has to use his judgment, care and watchfulness in order to get good results. If one has good machinery and knows how, when and where to adjust his different machines, with the ordinary help, his production should average somewhere near normal, for the quality of work a practical man knows to be fair production for the stock that is being worked. A practical manufacturer knows that if he starts with 7/8 inch staple that he cannot expect the same production that 1 1/8 inch staple will give for the proper number of yarn this latter staple is expected to produce. One is compelled to mix the stock, card, draw, and twist it according to the quality, length of the staple and weight of sliver to be made in carding and spinning rooms, paying close attention to the setting of the rolls on all machines, but especially to the drawing, bearing in mind that draw frame rolls, if not properly adjusted to the weight of the sliver and length of the staple, will cause more bad work than any other process in the whole mill (of course I am not referring to colored or dyed work where the quality of the cotton is impaired or burnt up in dyeing or bleaching), I am talking of common cotton.

In the spinning room the special points to be considered are the draft, the setting of the rolls, the weight of traveler, the twist and the speed of spindle. I do not claim that one can take an inferior quality of cotton and produce as large production and as strong yarn as can be made with a good quality, yet I claim that if the above points are taken into consideration, and that the different machines are adjusted at the proper time to suit the cotton, that the work will run well and that there will not be a constant kick from poor cotton and bad running work. The main trouble with bad running work is stock not properly mixed, machines not adjusted to produce best results and inefficiency and lack of judgment of overseers and superintendents. Spinning will generally run fairly well if the roving is good, regardless of weather conditions, if the five points noted above are taken into consideration and altered to suit existing conditions.

Weather conditions do effect the running of work to some extent but these instances where the weather gives trouble are not of such frequent occurence that this trouble cannot be overcome by the use of humidifiers and air conditioning machines. In lieu of them one must use a sprinkler pot filled with warm water in cold crisp weather when there is a lot of electricity in the air and cold water when air is dry and hot. If he can get a few jets of steam turned into the room the electricity will quickly disappear. Consequently, I do not consider that the weather conditions give one any great amount of trouble that cannot be remedied by a small outlay for a crude, but effectual, remedy. It is true that weather conditions in the North effect the running of the work more than it does in the South, but the mills of the North have been built or remodeled to suit these weather conditions.

The condition of the mill is the vital point and the one I consider the most important. Often the machinery is badly worn. If cards have been abused and the clothing is in a run down condition, and the machinery in general, old and badly worn, what can one do to remedy weather conditions or make poor cotton run well? The cotton and weather conditions are nothing to be compared with a bad condition of a mill. If the condition of the mill is good then by skillful management these other two conditions can be controlled and remedied, but if the machinery is gone the condition is bad. Therefore, under these conditions, good cotton and good weather will not make work run well and the mill turn off a good production. I have been along this road and look back at times when I have been worn out and disgusted because the work would not run. I laid it to bad cotton and the more I worked the more convinced I became that such cotton could not be worked successfully, but was a dead loss to the company. It was true the cause of the trouble was the cotton, yet the biggest trouble was myself, for I did not do what I should have done at the proper time. After worrying until I lost all patience, I went to the superintendent and told him the cotton was no good, the staple was so short that it would not run. He knew that the staple was short and that it was a poor quality of cotton, and also knew that we had to run it, so he came out and looked the situation over and did just exactly what he should have done, but opposite to what one would suppose would be the proper thing to do.

I had failed to take into consideration the density and toughness of my work, consequently he soon showed me my trouble, and in a short while every thing was running along comparatively smooth and we were soon getting a good production from this short staple lot of cotton. Now what was the trouble? Why! this poor lot of cotton to be sure! Yet that was no excuse. The main fault was my lack of knowledge. I had failed to consider the density and toughness of the stock to be drawn as I was sure that this short staple cotton could be handled in the usual way. I have worked on numbers from 2 1/2's to 40's yarn, and made both regular and very hard twist roving, and run cotton from dog tail to 1 1/4 inch staple, cotton waste and very low grades, even forked cotton up with pitch fork in order to shake the dirt and sand from it and run same, and got fairly good results as to its running qualities, and still contend that if one is up on his job and will apply the remedy to the seat of the disease, there is always a medicine to be found that will cure the trouble if applied to the right place at the proper time.

Give me good conditions in a mill and I will not let the weather or the cotton give me too much undue trouble, for the work can be handled successfully if the condition of

Barrett Specification Roofs

Why Architects Recommend Them

THE great modern hospital shown below has a roof area of 71,000 square feet. After careful investigation, the architect specified Barrett Specification Roof because by so doing he absolutely made sure of the following:

First: That the specification afforded a fair basis for bidding by contractors, because it is scientifically and accurately drawn.

Second: That the roof would be constructed of the best materials in the best way.

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Fourth: That the unit cost, that is, the cost per foot per year of service, would be less than that of any other type he might select.

These are the reasons that have made Barrett Specification Roofs more popular than ony other kind used on permanent structures.

Whenever an up-to-date architect or engineer can use a Barrett Specification Roof, he does so.

A copy of the Barrett Specification will be sent free on request.

Special Note

We advise incorporating in plans the full wording of The Barrett Specification, in order to avoid any misunderstanding.

If any abbreviated form is desired, however, the following is suggested.

ROOFING — Shall be a Barrett Specification Roof laid as directed in printed Specification, revised August 15th, 1911, using the materials specified and subject to the inspection requirement.

BARRETT MANUFACTURING COMPANY

New York Chicago Philadelphia Boston St. Louis Kansas City Cleveland Cincinnati Minneapolis Pittsburgh Seattle Birmingham

THE PATERSON MFG. CO., Ltd.:—Montreal Toronto Winnipeg Vancouver St. John, N. B. Halifax, N. S. Sydney, N. S.

TRADE B MARK

West Penn Hospital, Pittsburgh, Pa. J. L. Beatty Architect.

the mill is good. Of course, if one has to spin yarn that has to be dyed or bleached then the strength of the yarn is the important point and no matter how well his work is carded, nor how carefully his rolls are set and his work drafted, if he has started with a weak, tender-fibered cotton, his yarn will be weak. I have seen that worked and threshed out to my satisfaction. We were running along very nicely. The agent decided to buy another lot of cotton, which he contended was as good as the grade and quality that we were using. The breaking strength of the yarn went down. Every machine from the spinning frame to the picker room was gone over and readjusted. Samples were run from the new setting. The breaking strength remained down. New settings were made and the breaking strength still remained down. I told the agent that I was convinced that the trouble was in the cotton. This he stoutly denied and claimed that it was not the trouble, that the trouble laid in the settings of the machines or the tension of the roving on the fly frames. So, after quite a while, it was decided that the cotton was at fault and part of the equipment was wrong. These faults were remedied and the breaking strength of the yarn went up. In this instance I laid most of the fault to a weak and tender grade of cotton. The staple was there, it measured up well, looked good, yet it failed to have the elasticity, strength, and life that our former cotton had, consequently it would not produce as strong a yarn. I can now readily see that this trouble could have been greatly lessened by an addition of 50 per cent of the former standard grade of cotton to the mix in the opening room, one less wrap of the pressers on roving frames, and a few extra turns of twist on the spinning frames. Thus it can be seen that by keeping good conditions throughout a plant, if the weather or cotton gives some trouble, the overseer and superintendent, if they are practical and capable, can generally overcome these difficulties by applying a common-sense remedy at the proper time and right place.

Ga.-Ala. (Alabama.)

Editor Cotton:

In the August issue I note that "X. Y. Z. A." wants to know which is the most trouble in a cotton mill, the weather, the cotton or the condition of the mill? I note also that "X. Y. Z. A." wants the question answered from experience and not from book knowledge.

Good for you "X. Y. Z. A." On the last point I am right with you, as we have had too much book knowledge, and it's about time a switch was made to practical experience.

As I see it, the condition of the mill is the most trouble, for the reason that when a mill is in bad condition the work never runs well. Picture in your mind if you can a mill running a 70 to 85 grain finished sliver, which causes what I term choppy drafting in the proceeding processes, due to the frictional contact of the front top leather roll. Cards in poor condition and badly set added to the above, would certainly cause more trouble than either the weather or the cotton. Drawing rolls on all frames not properly spaced together with the rolls dry and dirty, will certainly make conditions deplorable. Bolsters on the fly frames clogged with dirt which offers a certain amount of resistance to the cone belt, for as you know, the cone belt indirectly drives the carriage, and any resistance to the cone belt affects the tension. Poorly repaired flyers, and flyers out of balance destroys the relationship of the surface speed of the front roll and bobbin and this last evil alone is worse than either weather or stock. Builders on fly frames in poor condition and causing running under and over. Machinery too highly speeded, especially fly frames, pickers and looms. A highly revolving beater will injure the stock and make conditions far worse than either weather or cotton. Still I know a mill at this writing where the beaters revolve 1600 revolutions per minute. Too high speed on fly frames destroys the intermediate speeds, or in other words, the true outline of the cones. Excessive drafts throughout the mill worse than either weather or cotton. With these things in mind, do not forget that these conditions will cause a mill to run badly whether the weather or cotton is good or bad, and that every day the mill is operated poor work is being made, together with a loss of production. Lastly, with a mill in poor condition, you never have a good running day.

With the cotton or weather it is different. Cotton is more troublesome than the weather for the reason, that I never saw a man yet who could make the work run well with poor cotton; we can, of course, help it some by shortening the drafts and adding a little twist, but still the work will run badly. It must be admitted that the weather is bad also and will cause a great deal of trouble, but it must not be forgotten that at the most we have only two bad months in the year. Again, we have in most mills more good stock than bad.

I only pictured the conditions in the carding as space does not permit me to go through the mill, but I think that "X. Y. Z. A." will agree with me that if what I pictured really existed in any cotton mill it would make very discouraging reading for the stockholders, and it would be a wonder for a mill with the above conditions existing together to be able to run at all.

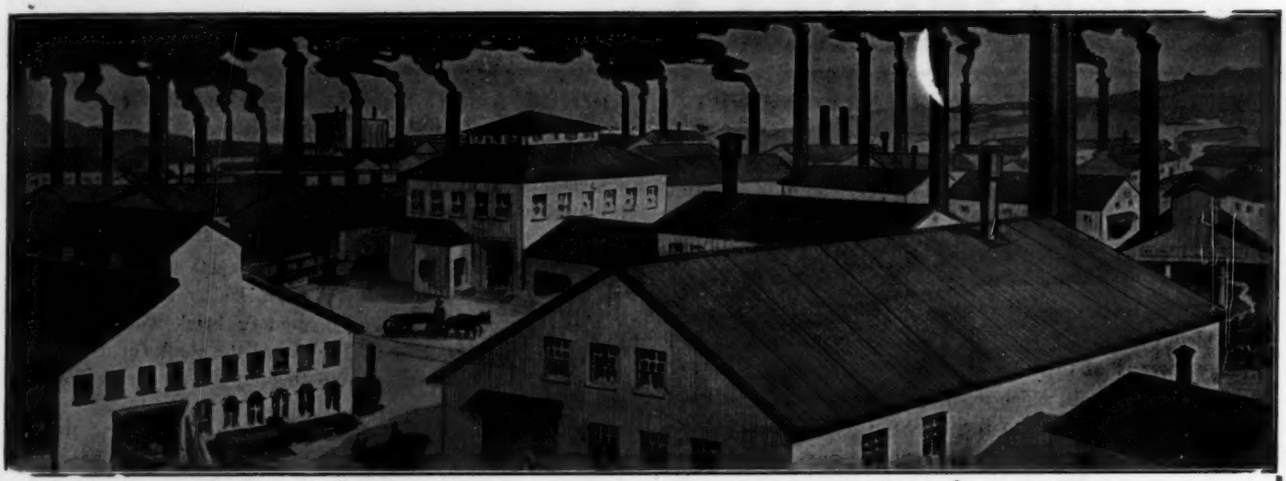
However, I am glad to say that I hardly think a mill can be found where all the above conditions exist at the same time. So the most trouble in a cotton mill is (1) the conditions, (2) the cotton and (3) the weather.

Wash. (New York.)

NOTICE.

The editorial department of Cotton is desirous of locating Eugene Herring, formerly of Greenville, S. C. Anyone knowing his present address will confer a favor on Mr. Herring by forwarding such address to this office.—Editor.

The annual report just issued by the German Imperial Testing Department states that quite a number of samples of defective artificial silk were received during the past year for examination. The faults in the material took the form of chalky-looking places which were without luster and very tender. In all cases the goods had been produced by the guncotton process. The defects were traced to the presence of free sulfuric acid, due to the decomposition during storage of cellulose sulfate compounds formed in the process of manufacture. A number of apparently pure silk goods were also tested in the laboratories for artificial silk, and in several instances this was found to be present in a large proportion. The mixture is stated to have been very difficult to distinguish from pure silk by mere visual examination even by experts, the adulteration having been made during the throwing operation by doubling fibers of artificial silk along with those of the natural silk, and the pieces woven from the yarn so produced.



THERE ARE OVER 300 IMITATIONS OF

RU-BER-OID
ROOFING

Some of these imitations look like RU-BER-OID but that is merely on the surface. The roofing buyer cannot see what is underneath, or he would not be fooled in buying goods on their appearance only.

As a house built on a poor foundation cannot last, neither can a roofing founded on poor material give the service expected of it.

Take None but the Genuine

RU-BER-OID

Accent on the "RU" and always spelled with one "B"

Unless the RU-BER-OID Man is shown on the outside wrapper, the roofing is not the genuine RU-BER-OID

KA-LOR-OID
(Colored Ruberoid)
ROOFING

RED—BROWN—GREEN

The permanently colored prepared roofing

The ideal roofing for Bungalows, Cottages—in fact suitable for any building where artistic effect is desired.

The Standard Paint Company,

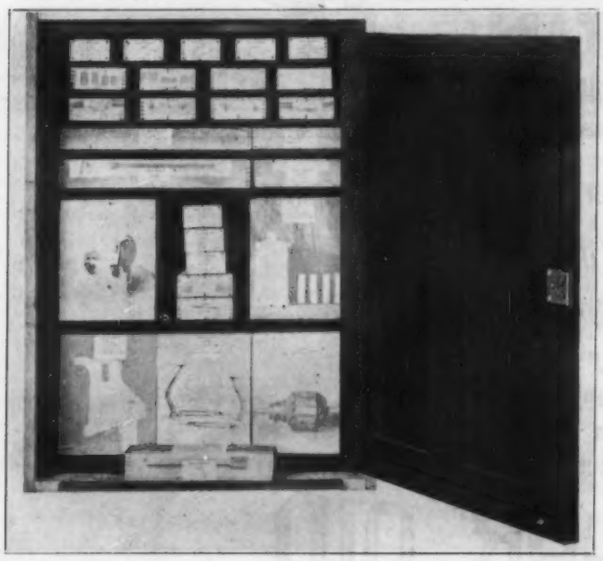
100 Williams Street, NEW YORK

BOSTON. CHICAGO. DENVER.

NEW MACHINERY AND TRADE NOTES.

THE BARBER-COLEMAN PART CABINET.

For several years, the Barber-Colman Co., of Rockford, Ill., have been using a unique system in connection with the part cabinet furnished with the Barber Warp Tying Machine. Instead of selling this extra part case outright, they, by an agreement with the user of the machine, furnish the extra part case with the parts contained therein in sealed packages. The holder of the case does not have to pay for any of these parts until the seals upon the packages are broken, in which event, as per written agreement, he signs and forwards to the Barber-Colman Co., a notice card which is contained in each package and which advises the fact that he has opened the package of parts. The case contains those parts which are most liable to give out through wear and tear, mis-use or neglect. Thus the holder is protected against a serious breakdown without the necessity of his carrying on hand a stock of parts of his own. Packages containing any parts which wear out frequently, are immediately replaced by the Barber-Colman Co., upon



Extra Part Case for the Barber Warp Tying Machine, Model E.

receipt of a notification that the preceding package has been opened.

While this scheme is rather an unusual one, the experience of this company demonstrates that it works out very satisfactorily. Of course, it ties up a considerable amount of money as a great many extra part cases are needed in the various mills, but it is proving nevertheless an excellent investment inasmuch as it shows an evident desire to build business on service. The illustration herewith is a reproduction of one of these part cases.

A. D. Salkeld & Bro. have incorporated to manufacture yarns, etc., capital $75,000. The corporation succeeds to the business of A. D. Salkeld, at 366 Broadway, New York. The incorporators mentioned are Andrew Salkeld, New York, and William J. Carver and Harry E. Carver, of East Orange, N. J.

JOHNS-MANVILLE CO. OPENS BRANCH IN GALVESTON.

The spirit of business enterprise which characterizes this aggressive concern is once more evidenced by the opening of a new office and warehouse in Galveston, Texas. The H. W. Johns-Manville Co. now boasts three offices in the Lone Star state, *viz.*, at Houston, Dallas and Galveston. At the last named place, in a modern brick warehouse of large proportions, will be consolidated the stock for distribution to the different offices and throughout the firm's Texas territory.

Galveston, because of its location and shipping facilities, makes an ideal concentration center. The company plans to receive direct at this point, heavy shipments by coastwise lines from New York. The steadily increasing trade with Central and South America also makes Galveston a convenient point of distribution.

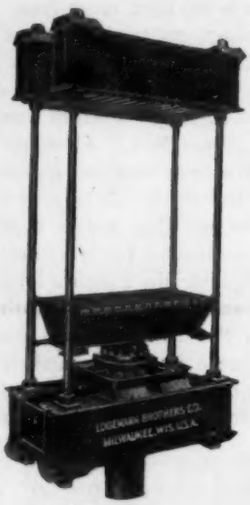
This company is among the country's largest houses dealing in roofing, building materials, packings, pipe coverings, insulating materials and electrical goods, and is the world's largest manufacturer and distributor of asbestos goods. This concern owns extensive asbestos mines in Danville, P. Q., Canada, and has nine factories located in various cities throughout the United States.

What is claimed to be a distinct advance in temples has been made by the Hopedale Mfg. Co., Hopedale, Mass. These have not only exceptionally long and broad bearing surfaces to prevent wear by reciprocation and the tension of the fabric, but also practical means for adjustment to take up what wear does occur. The double bearing surfaces at each side of the bar act upon supplementary surfaces of the holder. Square stock is set into a milled slot in top of bar which holds the bar firmly and altogether offers strong resistance against twisting, as well as against ordinary vertical and horizontal pulls. A neat lock is provided to hold temple away from cloth when "picking out." The temple rolls are made from seasoned dogwood—with pins ground and polished, and with convex points, allowing ready entrance and withdrawal from the cloth.

More old-fashioned manufacturers that are still using tallow as a softener would be greatly astonished at the superior results obtained with the soluble softening oil, made by The Arabol Mfg. Co., 100 William street, New York. They would be struck by the smooth finish of the warps, the easy parting of the threads in the lease rods, the clean and bright appearance of the slasher cylinders. They will find the soluble softening oil in the same condition at all seasons, sweet, pliable, uniform, winter and summer. It is neutral and easily handled. With close-woven goods, such as corduroys, velveteens, sateens, umbrella goods, cambries, etc., it gives especially fine results.

Mirror spinning rings are finished by machines and processes invented and patented by Frank H. Thompson. These are now owned by the Draper Company, Hopedale, Mass., the manufacturers of Mirror rings. The trade mark "Mirror" was adopted because of the extremely high polish obtained on these rings. Write for information.

Baling Presses



We build the largest line of Balers, all steel constructed, powerful, rapid and economical. Years of study have resulted in developing a machine that requires only one-third the power to make compression over any other built.

PAR EXCELLENCE

Our presses are built on mechanical principles, and will give permanent satisfaction. We have a reputation to uphold and will not offer an inferior article. The best is always the cheapest in the end.

Over 50 Styles—Hand—Belt—Electric—Hydraulic.

LOGEMANN BROTHERS CO.

280 OREGON ST., MILWAUKEE, WIS.

Southern Representative, J. H. MAYES, Charlotte, N. C.

CORTRIGHT
Metal Shingles

"The Permanent Roofing"

solve the problem of those old, leaky, wood-shingle roofs on operatives' cottages.

Let the old roof remain, and simply lay Cortright Metal Shingles over it as shown below.

No fuss, no dirt, no bother—less expense.

Cortright Roofs are fireproof, stormproof and last as long as the building, without needing repairs.

Send for catalog before reroofing or covering new buildings.

CORTRIGHT METAL ROOFING CO.
PHILADELPHIA
and
CHICAGO

Can Be Laid Right Over Wood Shingles

GLENLYON DYE WORKS

(Yarn Dept.)

CENTRAL FALLS, R. I.

FRANK A. SAYLES, Lessee

Bleachers and Dyers

OF

Cotton Yarns in Ball-warps and Skeins, Silk and Viscose Silk

SPECIALTIES: COLORS FAST TO BLEACHING, Mercerizing, Laundering, Cross Dyeing and Light. Dyed Novelty Effects in Fast Colors. High Grade Bleaching of Cotton Warps and Skeins. Silk Dyed Fast to Boiling Off and Bleaching.

Insist on Having

"GLENLYON DYED YARNS"

Safest and Most Reliable in the Market.

Write for Shade Card, Information and Guarantee.

The "1912" Cloth Cutting, Folding and Winding Machine

This machine will cut down operating expenses. It does in one operation the work which is now being done in two. It cuts the cloth, folds the edges and rolls them up in one operation, and at all times gets one more strip out of a bolt of cloth than is possible with the old method of cutting. At the same time it measures the bolt of cloth to show the manufacturer whether or not he is getting the number of yards he is paying for. With the high price of cotton to-day every knit goods manufacturer ought to look into this to see if he is getting the maximum efficiency at the least expense. You will find when you come to figure it up in the course of a year that the labor it saves is a big item.

Also have other labor-saving devices, and upon application you can get prices and full information on same.

J. A. FIRSCHING, 50 John St., Utica, N.Y., U.S.A.

WORTH TRYING

Alumina Soapalite

SOMETHING NEW FOR WASHING

THOROUGH AND HARMLESS

GET FREE PARTICULARS

THE ELECTRIC SMELTING & ALUMINUM CO.

Patentees and Sole Mf'rs. **LOCKPORT, N. Y.**

OLDEST STEEL PULLEY CONCERN ADDS NEW BUILDING TO PLANT.

The American Pulley Company, of Philadelphia, makers of steel split pulleys, have increased their equipment with another big building. The growth of this concern shows how much can be really done by right business methods. With the American Pulley Company, business has been more than the mere consideration of finding a market for "American" pulleys. The establishing of this market (there are over 2,000,000 "Americans" in service) has been the natural outcome of strict adherence to a well-defined high standard. This pulley is perfect in principle and its construction rests upon the most modern methods and most expert workers. Furthermore, the policy maintained by the "American" Company in its relation with its customers, and competitors, has always been along the most advanced lines of higher business ethics.

A business conducted on such principles cannot fail to grow—and so this new building, containing 54,000 square feet of floor space, or about 1¼ acres, became necessary. It will easily store 40,000 belt pulleys; but will also be devoted to the storage of sash pulleys, bushings and all finished products.

Plant of the American Pulley Company.

While "American" pulleys have always been quickly obtainable, due to the well-stocked branch houses of the company in Boston, New York and Chicago, and from over a thousand dealers advantageously located throughout the country; this big new storeroom will now make possible larger stocks being carried in Philadelphia of every size of pulley, from 3-inch to 60-inch diameters. Shipments to any point, domestic or foreign, will be greatly facilitated; more efficient service can be rendered to customers; and increased satisfaction for makers and users of "American" pulleys will result.

The entire structure is absolutely fireproof. It has brick walls, tile roof, concrete floors, metal racks, metal bins and shelving, and metal window frames. There is more floor space under this one roof than was occupied by the entire plant when established here 13 years ago. There will be a second story office 30 feet x 100 feet. The office staff will move into its new quarters in October.

The following letter, which the Joseph Dixon Crucible Company, of Jersey City, N. J., sends us, is of much interest. This letter is from Fred Heckler, superintendent of motive power for The Lake Shore Electric Railway Company, at Fremont, Ohio. The letter follows:

Referring to your communication of May 16, which was in reference to your graphite cup grease No. 2, which we are using on our trolley wheels. We have been using this for the past four or five years for trolley lubrication. We manufacture our own trolley wheels and they are so constructed that we have an extra large chamber for lubricant. We use a graphite bushing for a ⅝-inch pin 2 inches long only. We take the graphite grease and thin it slightly with oil, making it somewhat thinner in the winter than in the summer. This lubricant is then forced into the chambers of the wheel with a force pump in our shop and the wheel is then put into the harp attached to pole and is ready for service, and this is all the lubrication that is required for the life of the wheel. In the majority of cases we use the bushing over again on the second wheel. We have an air press for forcing these bushings in and out of wheel.

During the past sixteen years we have done considerable experimenting in trolley wheels and lubricants, and it has been our experience that the graphite cup grease No. 2 is the very best lubricant that can be obtained for this purpose. On trial equipments, we have operated trolley wheels for seven and eight thousand miles; however, in figuring up our average mileage on trolley wheels by the year, taking into consideration wheels that are lost, broken, and in some cases stolen, our average mileage is approximately 4,000 miles.

The Bayer Company, Inc., 117 Hudson street, New York, are sending to the trade the following color cards: Diazo brilliant scarlet R O D; Katigen green M K extra; and Diazo fast green G F. Copies of these color cards may be secured by those interested.

CLINCHFIELD COAL
CUTS DOWN THE COST

NIGRUM OILLESS SADDLE BEARINGS.

We have on a number of occasions called attention to the treated wood products of the Graphite Lubricating Co., of Bound Brook, N. J., but their latest specialty, the Nigrum saddle bearing, will doubtless prove of especial interest to our readers.

This bearing which has been on test in a great many Southern mills, is made in two styles, one being a two-piece saddle, a good deal like the ordinary cast-iron saddle which lubricates the roll through capillary attraction; the other style being in one-piece is of course somewhat less expensive. Either of these saddles, it is claimed, does away entirely with the use of oil and grease, as both are self-lubricating. The illustration shows the one-piece saddle bearing, while the construction of the two-piece saddle is shown elsewhere in this issue.

If the claims of the makers are substantiated, the use of these bearings will not only mean quite a saving in oil alone, but in the amount of seconds caused by oil spots and stains on the finished yarns. It will also eliminate troubles in the way of uneven yarn, etc., that arise from dry roll bearings caused by careless operatives, and save much of the time now spent by operatives in cleaning and oiling.

Nigrum saddle bearings are well worth the careful attention of mill men looking for a large quantity and a better quality of product. The makers, the Graphite Lubricating Company, will undoubtedly be glad to furnish samples and other information to interested parties. Tell them you saw it in Cotton.

An interesting little book that has reached the editor's desk during the past month is entitled, "Statistical History of the American Cotton Crop," by James J. Lea, of New Orleans, La. This little book contains the salient facts of the history of the American cotton crop for something over 30 years, boiled down into table form, and of value not alone to the student of economics, but as well to producers, merchants, and manufacturers who are intimately concerned in the great staple crop—cotton. The greatest care has been exercised in the compilation of these statistics, and only such points have been covered as will afford a really intelligible idea of the importance of the American cotton crop and the influence governing its production and distribution. Mr. Lea was largely assisted in the preparation of this work by Henry G. Hester, the world's accepted authority upon all matters pertaining to American cotton. The author quotes his authority in all cases. It is prepared in a neat form, bound with heavy paper, and a part of the book contains blank pages for a shipping record and a contract hedging record for cotton purchases and sales. It will be a convenient and useful book for all cotton buyers, and will no doubt be well received.

Lockwood, Greene & Company, the prominent architects and engineers with main office at 60 Federal street, Boston, announce the establishment of a Canadian office under the name of Lockwood, Greene & Company, of Canada, Ltd., with headquarters in the McGill building, Montreal.

MILL NEWS

Notices of mill projects, additions or Improvements are solicited for this department

ALABAMA.

BIRMINGHAM. Z. H. Mangum, the popular superintendent from Gibsonville, has recently accepted a position as superintendent of the Avondale Mills, of this place.

HUNTSVILLE. The Abbington Cotton Mills have resumed operation after a suspension of several weeks. The mill is now in first class condition, having made complete repairs to its plant and equipment during the stop.

GEORGIA.

CEDARTOWN. There is a proposition on foot to build a rug factory at Cedartown where rag rugs and cheap grades of cotton ingrain carpets can be manufactured. The promoters will be glad to see catalogs of machinery for the necessary dyeing and weaving. Yarns will probably be bought. Communications in this regard should be sent to C. R. Borders, Cedartown, Ga.

CHICKAMAUGA. The Crystal Springs Bleachery is building a number of new houses to accommodate the families of their operatives.

COLUMBUS. Swift Manufacturing Co. is planning to erect a new $10,000 warehouse on Sixth Ave.

EAGAN. The Martel Mills are adding four spinning frames and one warper to their present machinery.

LA GRANGE. The Park Cotton Mills will install electric power and have placed a contract for the equipment of 150 horsepower.

LA GRANGE. The Dunson Mill, at LaGrange, is building seven new experiment houses for their operatives on land east of the city. The contractor is rushing the work as fast as possible.

ROME. It is reported that the Rome Hosiery Mills are to build a two story addition costing approximately $7,000, and in which they will install additional machinery to increase the capacity of their present plant.

MASSACHUSETTS.

FRANKLIN. A new hosiery concern with W. F. Brown at its head, will probably start operation shortly in its factory building at Franklin.

PITTSFIELD. Fire recently damaged the napping room of the Musgrove Knitting Co., manufacturers of children's and ladies' cotton goods underwear. Repairs will be made immediately.

NORTH CAROLINA.

CHARLOTTE. It is reported that the Fidelity Mill will add approximately 1,000 spindles to their present equipment at an early date, and expect to start up on night work in he near future.

HAW RIVER. The Holt-Granite Mills are reported as expecting to purchase some additional cards and roving machinery in order to attain a better balance in their mill

HIGH POINT. It is rumored locally that a third cotton mill will probably be built here in the near future.

KANAPOLIS. The new mill of the Carburrus Cotton Mills will have 20,000 spindles and is to be operated on 30 to 50 hosiery yarns. It is reported that they will have 64 Nasmith comber heads and will also be equipped with twisters. The excavation for this mill has been completed and the foundations and structural work are now going forward.

SALISBURY. The Salisbury Cotton Mills expect to build a two story brick addition according to local report.

OKLAHOMA.

OKLAHOMA CITY. The Oklahoma Hosiery Co., which was recently incorporated with a capital stock of $70,000 is becoming the manufacture of a line of medium priced ladies hosiery. The plant has a capacity of 400 dozen pairs a day and the company expects to dispose of its product direct instead of selling to jobbers. This company is headed by P. H. Lindley, of Oklahoma City, as president, and J. B. Barker, of Philadelphia, as superintendent.

SOUTH CAROLINA.

COLUMBIA. The Southern Aseptic Laboratories are taking steps toward the rebuilding of that part of its plant which was recently damaged by fire.

GAFFNEY. An addition is to be built in connection with the Irene Cotton Mills, of this city.

KERSHAW. The machinery for the Kershaw Cotton Mill has arrived and is being rapidly installed. S. G. Dover, of Bemis, Tenn., is to be the superintendent.

TEXAS.

DALLAS. The Dallas Cotton Mills will make an additino to their card room equipment in the near future.

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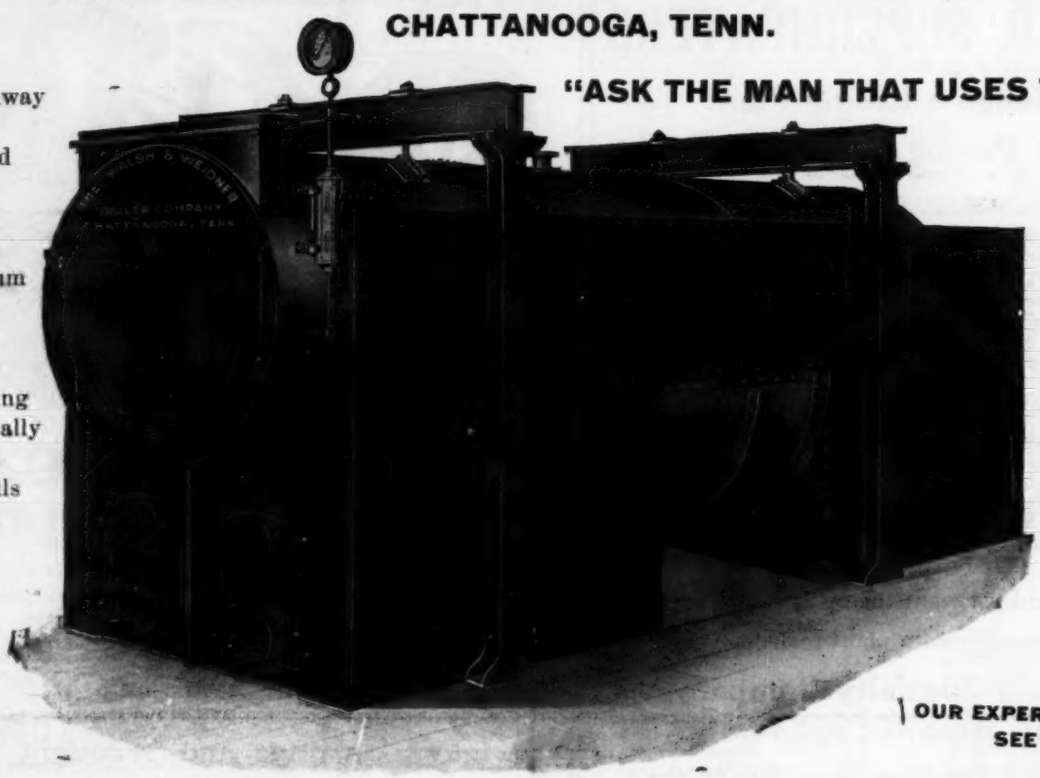

Let your Engineer see this, then let us arrange for our customers to tell you of the big fuel saving it is effecting for them.

OUR EXPERTS WILL SEE YOU.

TUBULAR BOILER SET WITH PATENT STEEL SETTING

Cost of Rope Drive

vs

Belt Drive

In drives of 200 h. p. and up, and where the shafts are more than 30 feet center to center, the cost of rope drive will be from 15 to 50% less than that of belts, according to distance and size of drive.

When you think of the far smaller cost of maintenance of rope drives, doesn't it seem worth your while to investigate and compare further?

We don't claim that rope transmission is best **everywhere** but we do know that it is best in an enormous number of plants that do not now realize it.

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This is the most complete reference book we know of, on rope driving—it's really a text book for the engineer. Ask for a free copy today.

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No steam plant can reach its maximum of fuel economy without the use of superheaters—a broad but true assertion. Often by installing our superheaters a wasteful plant running at a loss may become a paying investment. Boilers not designed for high pressure or old boilers can be fitted with them and rendered serviceable.

The Foster Superheater has many advantages in the way of saving fuel, of increasing efficiency of engines, boilers, pumps, etc., and of general economy, and we want the opportunity to lay its merits before all steam plant owners.

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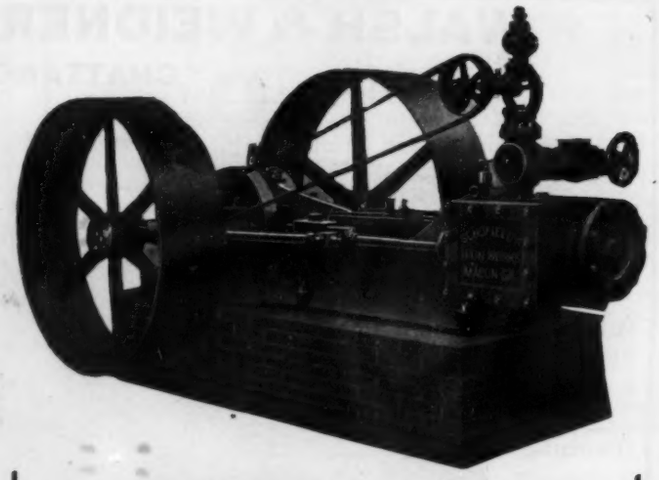

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Heavy Castings and Wrought Iron Works.

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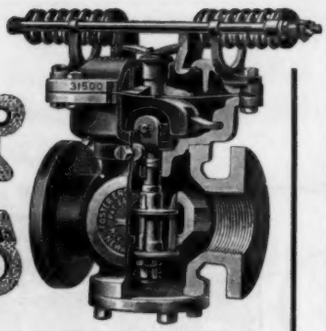

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Fast-running, high-power, modern machines, demand the installation of the pressure controlling and pressure regulating appliances that will give the most positive and reliable service under all conditions. That's why we emphasize the fact that RELIABILITY is the main feature of Foster Valves.

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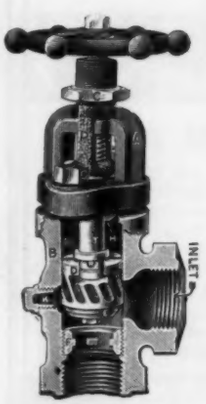

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(Especially The White Star Valve)

The Powell Cyclone Blow-Off Valve, cast of close grained iron of high tensile strength. Made in screw and flange ends, self-cleaning Boiler Valve.

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will return that water in your steam lines to your boiler.

IF the amount of your steam line condensation is of any volume at all don't waste it. Send for a Morehead Trap and see how quickly the Morehead System will show savings in your coal bills, repair expenses, etc., not to mention the great improvements in your heating system.

From 20 to 40% of the heat units in the water of condensation is lost by cooling the condensation down to accommodate a steam pump.

Morehead traps return the condensation with its *full* heat content direct to your boiler with practically no drop in temperature.

MOREHEAD TRAPS are being used everywhere on Heating, Drying and Cooking propositions of every kind, from straight pipe work to fan stacks and under vacuum conditions without regard to the difference in pressure between the apparatus drained and that carried on the boiler and without regard to the location of the apparatus drained, whether above or below the water line in the boiler.

There is a Morehead Trap for any kind of service. Just state your conditions and ask for our proposition.

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It's what a machine *does*, not what it *costs*, that is most important.

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will produce ten to twenty per cent. more work than any other typewriter ever made.

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Here are a few reasons:

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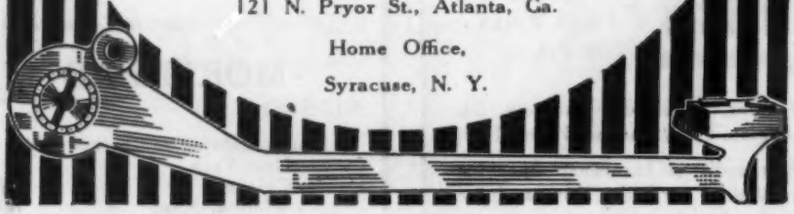

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Reg. U. S. Pat. Off.

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When you enjoy the economy of lubrication provided by

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TRY A BARREL FOR 60 DAYS

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May we go into the subject with you?

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Solid Belt Dressing

Has the unique quality of preventing belt slippage without causing that stickiness which consumes power in doing useless work. It is easily applied, acts instantly, and is equally effective on leather, rubber, canvas or fabric belting.

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Established 1827.

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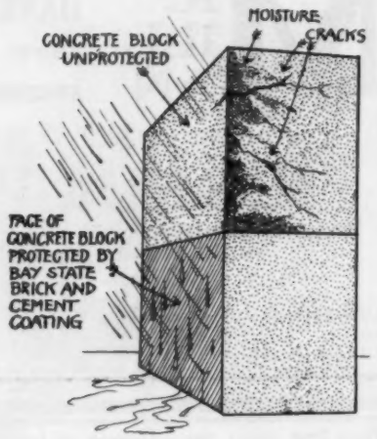
Prevent your concrete or cement from hair cracking with



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It excludes dampness and will protect building material from rust and disintegration.

Gives an artistic dull effect which does not take away the distinctive texture of concrete.

Can be used in mills, garages, private houses, hotels, railroad stations and office buildings.

Ask your dealer for it. If he cannot supply you write us. Drop a postal for Booklet P, which tells you all about Bay State Brick and Cement Coating.

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Pioneer, Positive, Powerful
Perpetual, Popular, Peerless
Removes Heat, Steam, Gases
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Reward of Merit.
Over 9,500 in use.

If you have trouble in your Acid, Dye, Engine or Drying room, we prescribe the Blackman Ventilator as a remedy. Consultation free. Send for highly interesting Catalogue to manufacturers.

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A Going Hosiery Mill
For Sale at a Sacrifice

A substantially constructed and well equipped Hosiery Mill in an aggressive Alabama city of 6,000 population, having a capacity of 550 dozen pairs of hose daily, is now offered for sale at a sacrifice price, due to inexperienced management and lack of sufficient working capital.

The property comprises 2½ acres of ground, several tenant houses, well constructed office, warehouse and factory buildings, equipped with 100 Mayo knitting machines, all necessary ribbers, loopers and sewing machines; 60 h. p. boiler and electric motor furnish sufficient power.

The plant is located on the main line of the

SOUTHERN RAILWAY

which affords excellent transportation facilities to all the large distributing centers.

The many orders now on hand, and the fact that future deliveries cannot be promised, show the good markets now existing for the factory's output.

This is an opportunity one will seldom find—a well established business, all equipment in first-class order, good location, big markets and a very low figure buys it all.

Refer to file No. 2495, and write for full particulars.

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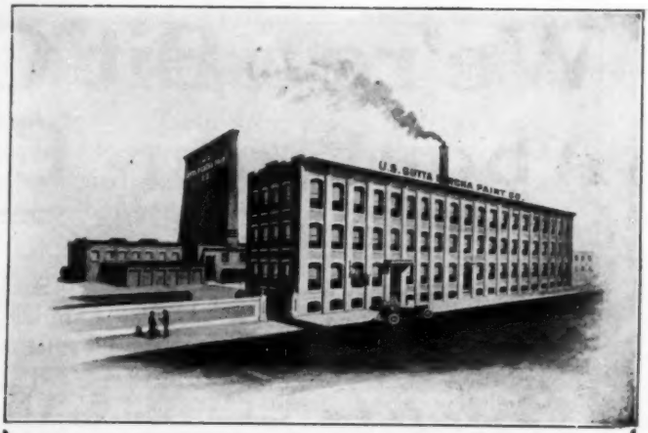

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The Original Mill White Paint

RICE'S Mill White is the only paint manufactured by the process which made the reputation of the name "Mill White." This process originated in the plant of the U. S. Gutta Percha Paint Co., and cannot be used by any other paint manufacturer.

RICE'S Mill White is the *only* oil paint containing no lead or varnish and giving a glossy, tile-like surface, which will neither crack and craze like enamel nor flake and scale like cold water paint.

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Write for Booklet and Sample Board

Ask for a copy of our booklet, "More Light."

Write today.

U. S. GUTTA PERCHA PAINT CO.

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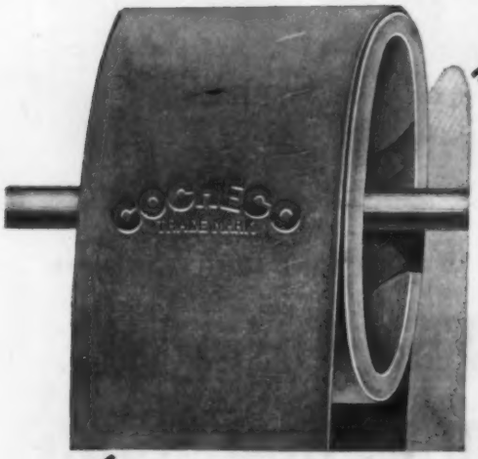
We're a Bit Old Fashioned About our Cocheco Belting



Back here, "home" in the hills of Dover we are a bit old fashioned in our pride of our old fashioned way of making leather belting.

We use nothing but the best grade of packer steer hides, tanned with the best white oak bark in the good old fashioned, long-process way. We curry the rough leather by a special process, developed and tried and tested in over 70 years' experience. Match the strips so that Cocheco belting will run straight; so that it will never run unevenly. And to make everything sure every workman is an inspector, examines each butt or strip or belt as it reaches him to check and find faults or flaws.

Let us give you an idea of how carefully Cocheco Belting is made and what users think of it.

I. B. Williams & Sons
DOVER, N. H.

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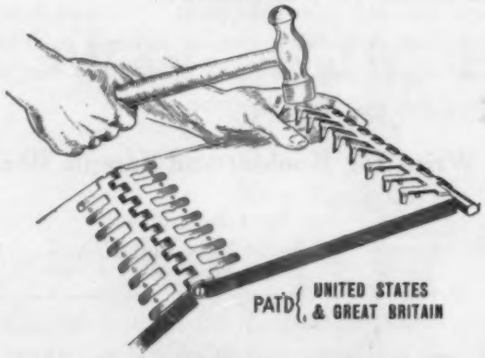

Steel Belt Lacing

Needs no tool but a hammer to apply. Gives a smooth, efficient hinge joint in *any* make of belting, and quickly.

Try it yourself; tell us the width, thickness and kind of belt used and we will send a sample lacing *free*.

"Alligator" joints save belting.

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And Has Been Adopted by the Representative Manufacturers of this Country.

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THE TURBO-HUMIDIFIER HANDED ONE MILL THIS

If in doubt whether an installation of Turbo-Humidifiers will pay you in dollars and cents, here is some food for thought.

"We take pleasure in advising you that the Turbo-Humidifiers which you have installed in our plant work to our full satisfaction. Knowing the trouble with other systems, the simple construction of your system appealed to us and we are glad that we ***picked out a good thing.***"

And here is another letter about the

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(***The Humidifier with the Guarantee***)

"Since we installed your system, our ***production has increased over 10%.*** The day we started up the Humidifiers we worked under very unfavorable conditions, yet within two hours after starting up, our machinery was turning out production to its full capacity."

Yes, we can show you stacks of other letters just as good as these.

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by the modern method.

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being Faster than Indigo to crocking, washing, chlorine and exposure are now used by American cotton goods manufacturers for all classes of dyed and printed fabrics.

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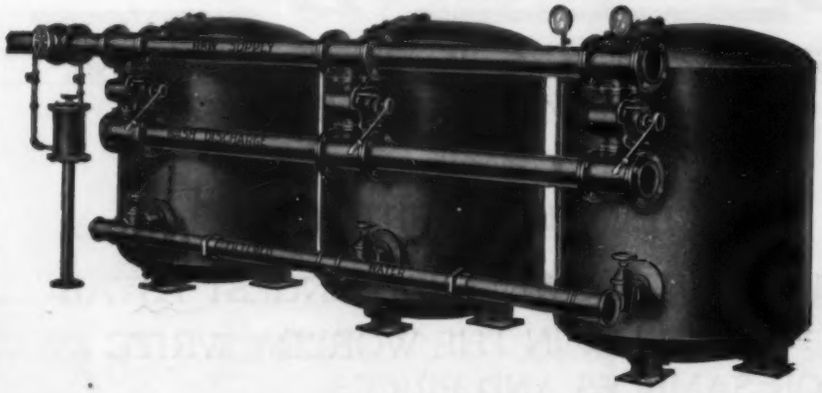
NORWOOD WATER FILTERS

Are Built in All Sizes to Suit Location and Conditions

A BATTERY OF THREE PRESSURE FILTERS.



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We do the rest if you write.

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The standard where economy combined with the best results is the end desired.

Our new soluble Tallow is unequalled for satisfactory results.

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having an aggregate capacity of over one hundred million gallons per day are in operation in the textile mills of this country.

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Interruption of Production

is recognized by textile mill operators as the most costly element of repairs.

Allis-Chalmers Textile Motors are so liberally designed and so sturdily constructed that they will operate for years without need for repairs, providing they are properly supplied with oil while in service.

"Motors for all drives."

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FOR BOILER FEED AND ALL INDUSTRIAL USES
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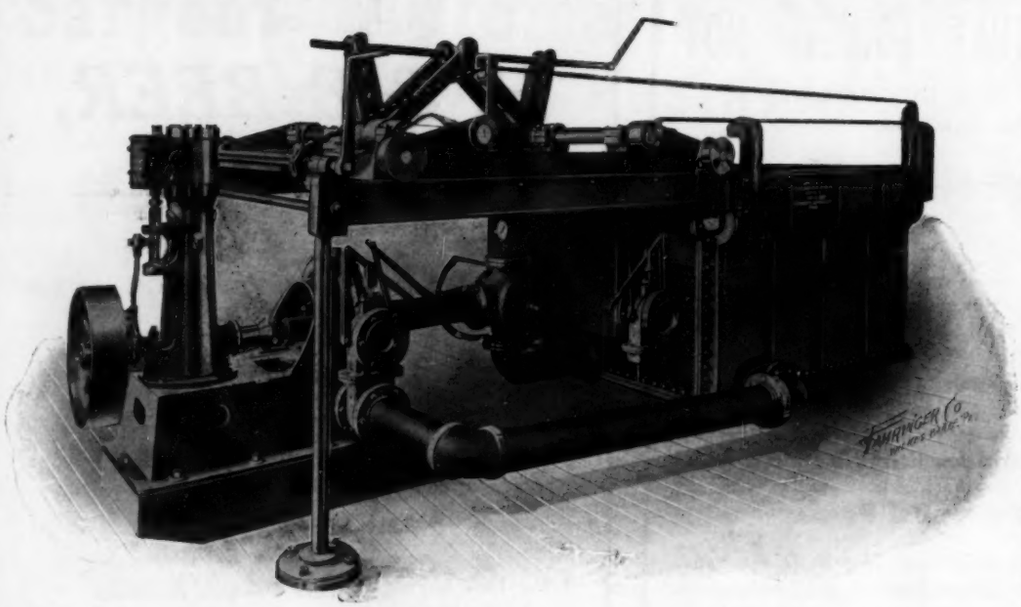
THIS MACHINE DOES THE "MOST PERFECT" DYEING AND BLEACHING



It is the Delahunty Circulating Type, Raw Stock, Dyeing and Bleaching Machine.

The cut shows how the Compressor Plate is raised and rolled back for loading and unloading.

Built in sizes from 150 to 1000 lbs. capacity.

This Machine will give you more positive circulation and nearer to absolutely perfect stock than any other process.

Dyes perfectly all the new vat colors.

Ask us for list of mills using them.

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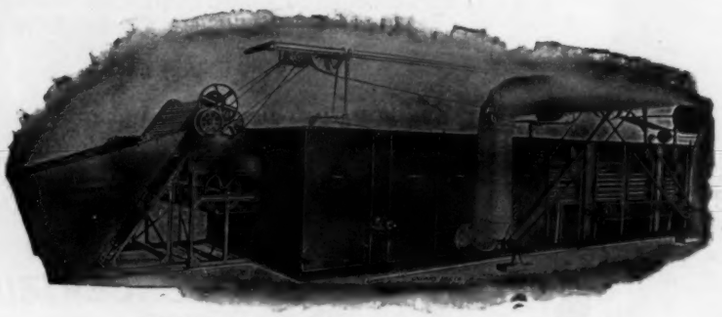

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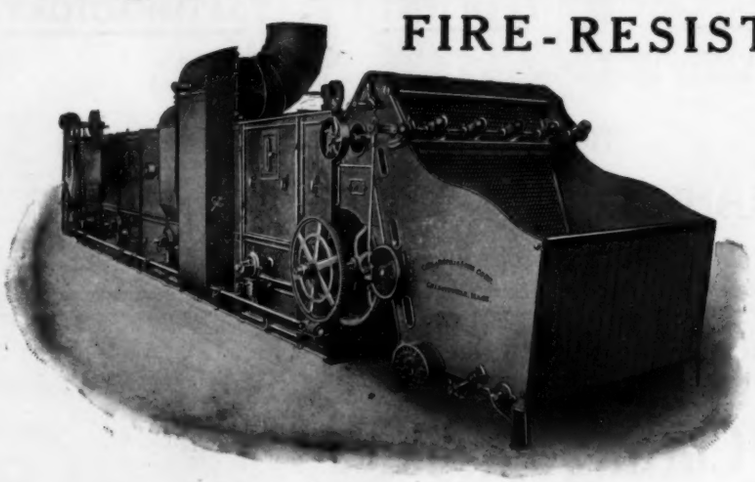

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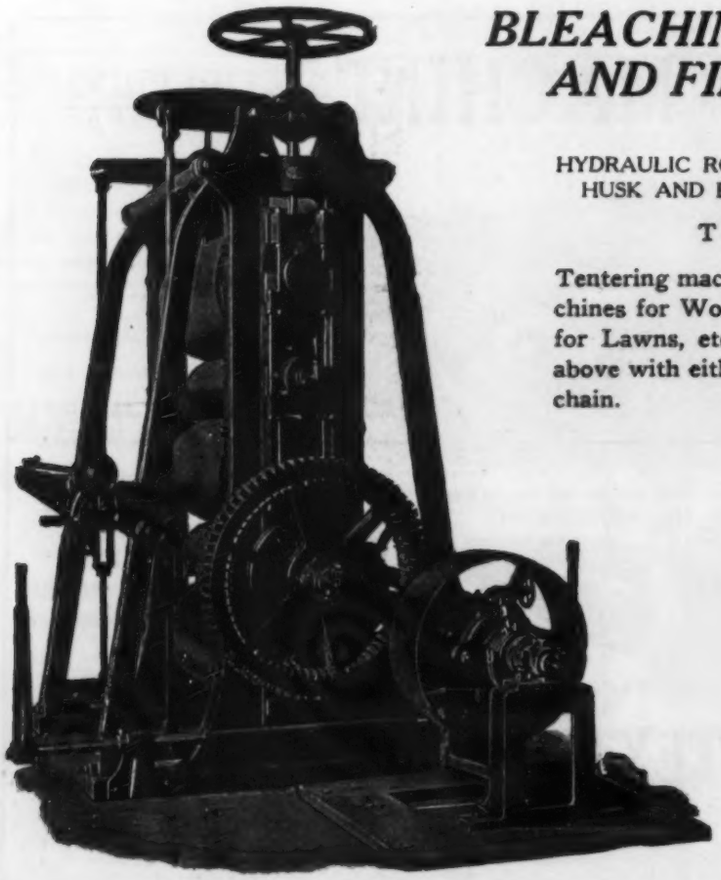

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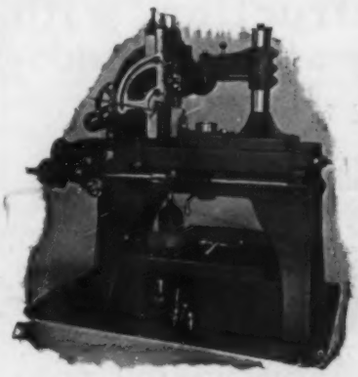

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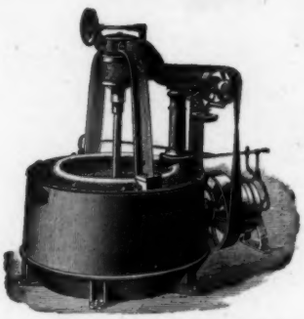

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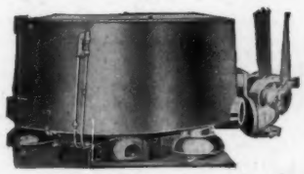

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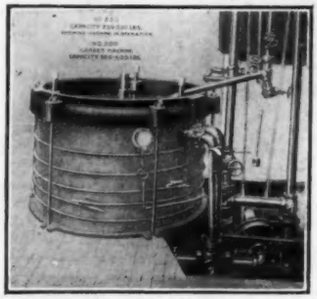

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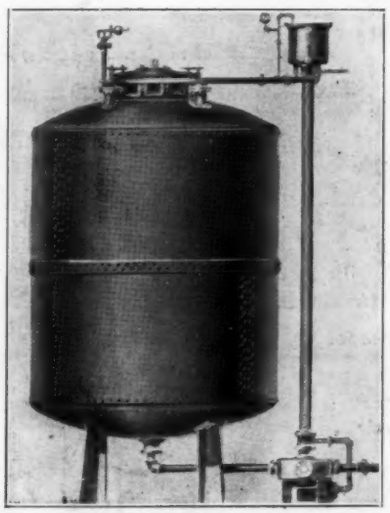

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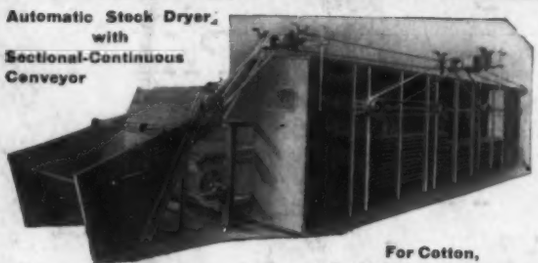

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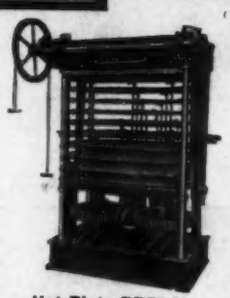

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